

SEQUENCE LISTING

<110> Muller, Mathias L.
 True, Thom
 Simmons, Carl R.
 Yalpani, Nasser

<120> Novel compositions with chitinase
 activity

<130> 549162000320

<150> 10/389,432

<151> 2003-03-14

<150> 10/290,086

<151> 2002-11-06

<150> 60/337,029

<151> 2001-11-07

<150> 60/420,666

<151> 2002-10-22

<160> 84

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 255

<212> PRT

<213> Zea Mays

<400> 1

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Cys	Gly	Thr	Thr	Asp	Ala	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser	Gly	Pro
			20					25					30		
Cys	Arg	Ser	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly
		35					40					45			
Gly	Ser	Gly	Gly	Ala	Asn	Val	Ala	Asn	Val	Val	Thr	Asp	Ala	Phe	Phe
	50					55					60				
Asn	Gly	Ile	Lys	Asn	Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe
65				70						75				80	
Tyr	Thr	Arg	Ser	Ala	Phe	Leu	Ser	Ala	Val	Asn	Ala	Tyr	Pro	Gly	Phe
				85					90					95	
Ala	His	Gly	Gly	Thr	Glu	Val	Glu	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe
			100					105					110		
Phe	Ala	His	Val	Thr	His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu
		115					120					125			
Ile	Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Ala	Ser	Asn	Arg	Gln	Trp	Pro
	130					135					140				
Cys	Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser
145					150					155					160
Trp	Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Asp	Ile	Gly	Phe	Asn	Gly
				165					170					175	
Leu	Ala	Asp	Pro	Asn	Arg	Val	Ala	Gln	Asp	Ala	Val	Ile	Ala	Phe	Lys
			180					185					190		
Thr	Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln
		195					200					205			
Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asn
	210					215					220				

Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Lys	Gln
225					230					235					240
Tyr	Cys	Gln	Gln	Leu	Arg	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	
				245					250					255	

<210> 2
 <211> 248
 <212> PRT
 <213> Zea mays

<400> 2

Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe	Gly	Tyr
1				5				10						15	
Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser	Gly	Pro
			20					25					30		
Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Gly	Gly	Gly	Gly	Ala	Asn	Val	
		35					40					45			
Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Ser	Gln	Ala
	50					55					60				
Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala	Phe	Leu
65				70					75						80
Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Ser	Gln	Val
				85				90						95	
Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Ala	Thr	His	Glu
			100					105					110		
Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Asn	Lys	Ser	Asn	Ala	Tyr
		115					120					125			
Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln	Lys	Tyr
	130					135				140					
Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr	Gly	Pro
145					150					155					160
Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly	Arg	Val
				165					170					175	
Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met
			180					185					190		
Asn	Ser	Val	His	Gly	Val	Val	Pro	Gln	Gly	Phe	Gly	Ala	Thr	Thr	Arg
		195					200					205			
Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Gly	Gly	Asn	Asn	Pro	Ala	Gln	Met
	210					215				220					
Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Arg	Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val
225					230					235					240
Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys								
				245											

<210> 3
 <211> 777
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(777)

<400> 3

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1				5				10					15		48
Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Phe	Cys	Cys	Ser	Lys	Phe

ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tcg ggc ggc ggc ggc ggc ggc ggc ggc ggc gga ggc	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
ggc gga ggc agt ggc ggt gcg aac gtg gct aat gta gtc acc gac gcg	192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala	
50 55 60	
ttc ttc aac ggc atc aag agc cag gcc ggg agc ggg tgc gag ggc aag	240
Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys	
65 70 75 80	
aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca	288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro	
85 90 95	
ggc ttc gcc cat ggc ggg tcg cag gtg cag ggc aag cgc gag atc gcc	336
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala	
100 105 110	
gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc	384
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile	
115 120 125	
aac gag atc gac ggg ccg agc aag aac tac tgc gac cgg aac aac acg	432
Asn Glu Ile Asp Gly Pro Ser Lys Asn Tyr Cys Asp Arg Asn Asn Thr	
130 135 140	
cag tgg ccg tgc cag gcg ggg aag ggg tac tac ggc cgc ggc ccg ctg	480
Gln Trp Pro Cys Gln Ala Gly Lys Gly Tyr Tyr Gly Arg Gly Pro Leu	
145 150 155 160	
cag atc tcc tgg aac ttc aac tac ggg ccc gcg ggg agg gcc atc ggc	528
Gln Ile Ser Trp Asn Phe Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly	
165 170 175	
ttc gac ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg	576
Phe Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val	
180 185 190	
gcg ttc aag gcg gcg ctc tgg ttc tgg atg aac agc gtg cac ggg gtg	624
Ala Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val	
195 200 205	
atg ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc	672
Met Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu	
210 215 220	
gag tgc aac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac	720
Glu Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr	
225 230 235 240	
tac aag cag tac tgc cag cag ctc cgc gtc gac cca ggg ccc aac ctc	768
Tyr Lys Gln Tyr Cys Gln Gln Leu Arg Val Asp Pro Gly Pro Asn Leu	
245 250 255	
act tgc tag	777

Thr Cys *

<210> 4
<211> 258
<212> PRT
<213> Artificial Sequence

<220>
<223> Variant sequence produced by shuffling techniques

<400> 4
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
1 5 10 15
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
20 25 30
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly
35 40 45
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
50 55 60
Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys
65 70 75 80
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro
85 90 95
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala
100 105 110
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
115 120 125
Asn Glu Ile Asp Gly Pro Ser Lys Asn Tyr Cys Asp Arg Asn Asn Thr
130 135 140
Gln Trp Pro Cys Gln Ala Gly Lys Gly Tyr Tyr Gly Arg Gly Pro Leu
145 150 155 160
Gln Ile Ser Trp Asn Phe Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly
165 170 175
Phe Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val
180 185 190
Ala Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val
195 200 205
Met Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu
210 215 220
Glu Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr
225 230 235 240
Tyr Lys Gln Tyr Cys Gln Gln Leu Arg Val Asp Pro Gly Pro Asn Leu
245 250 255
Thr Cys

<210> 5
<211> 756
<212> DNA
<213> Artificial Sequence

<220>
<223> Variant sequence produced by shuffling techniques

<221> CDS
<222> (1)...(756)

<400> 5
tcg atg cag aac tgc ggc tgc gcg tcg ggc ctg tgc tgc agc cgg ttc 48
Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe

1	5	10	15	
ggc tac tgc ggc acc acc gac gcc tac tgc ggc gac ggg tgc cag tcg	96			
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser				
20 25 30				
ggc ccg tgc cgc tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg	144			
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala				
35 40 45				
aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag agc	192			
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser				
50 55 60				
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg	240			
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala				
65 70 75 80				
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg tcg	288			
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser				
85 90 95				
gag gtg gag ggc aag cgc gag atc gcc gcc ttc ttc gcg cac gtc acg	336			
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr				
100 105 110				
cac gag acc ggg cat ttc tgc tac atc aac gag atc gac ggg ccg agc	384			
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asp Gly Pro Ser				
115 120 125				
aag aac tac tgc gac cgg aac aac acg cag tgg ccg tgc cag gcg ggg	432			
Lys Asn Tyr Cys Asp Arg Asn Asn Thr Gln Trp Pro Cys Gln Ala Gly				
130 135 140				
aag ggg tac tac ggc cgc ggc ccg ctg cag atc tcg tgg aac tac aac	480			
Lys Gly Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn				
145 150 155 160				
tac ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc	528			
Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro				
165 170 175				
ggc agg gtg gcg cgg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg	576			
Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp				
180 185 190				
ttc tgg atg aag aac atg cac cag ctc atg ccc cag ggg ttc ggc gcc	624			
Phe Trp Met Lys Asn Met His Gln Leu Met Pro Gln Gly Phe Gly Ala				
195 200 205				
acc atc agg gcc atc aac ggc gcc ctc gag tgc aac ggg aac aac ccc	672			
Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro				
210 215 220				
gcc cag atg aac gcg cgc gtc ggc tac tac agg cag tac tgc cgc cag	720			
Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln				
225 230 235 240				
ctc ggc gtc gac ccg ggc aac aac ctc acc tgc tga	756			
Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys *				
245 250				

<210> 6
 <211> 251
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 6
 Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala
 35 40 45
 Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser
 50 55 60
 Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
 65 70 75 80
 Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
 85 90 95
 Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
 100 105 110
 His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asp Gly Pro Ser
 115 120 125
 Lys Asn Tyr Cys Asp Arg Asn Asn Thr Gln Trp Pro Cys Gln Ala Gly
 130 135 140
 Lys Gly Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn
 145 150 155 160
 Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro
 165 170 175
 Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp
 180 185 190
 Phe Trp Met Lys Asn Met His Gln Leu Met Pro Gln Gly Phe Gly Ala
 195 200 205
 Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro
 210 215 220
 Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln
 225 230 235 240
 Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys
 245 250

<210> 7
 <211> 774
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(774)

<400> 7
 tcg atg cag aac tgc ggc tgc cag ccg aac gta tgc tgc agc aag ttt 48
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15
 ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30

ggc ccg tgc cgc tcg ggc ggc ggc ggc ggc ggc ggc ggc ggc gga ggc	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
ggc gga ggc agt ggc ggt gcg aac gtg gct agc gtc gtc acc ggc tcc	192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser	
50 55 60	
ttc ttc aac ggc atc aag agc cag gcc ggg agc ggg tgc gag ggc aag	240
Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys	
65 70 75 80	
aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aac gcg tac ccg	288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Asn Ala Tyr Pro	
85 90 95	
ggc ttc gcc cat ggc ggg acg gag gtg gag ggc aag cgc gag atc gcc	336
Gly Phe Ala His Gly Gly Thr Glu Val Glu Gly Lys Arg Glu Ile Ala	
100 105 110	
gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc	384
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile	
115 120 125	
agc gag atc aac aag agc aac gcc tac tgc gac gcg agc aac agg cag	432
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Ala Ser Asn Arg Gln	
130 135 140	
tgg ccg tgc gcg gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag	480
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln	
145 150 155 160	
atc tcg tgg aac tac aac tac ggg ccg gcg ggg agg agc ctc ggc ttc	528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ser Leu Gly Phe	
165 170 175	
gac ggg ctg ggc gac ccc gac gcg gtg gcg cgc agc gcc gtg ctc gcg	576
Asp Gly Leu Gly Asp Pro Asp Ala Val Ala Arg Ser Ala Val Leu Ala	
180 185 190	
ttc cgc tcc gcg ctc tgg tac tgg atg aac aac gtg cac ggg gtg gtg	624
Phe Arg Ser Ala Leu Trp Tyr Trp Met Asn Asn Val His Gly Val Val	
195 200 205	
ccg cag ggg ttc ggc gcc acc acc agg gcc atc aac ggc gcc ctc gag	672
Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala Leu Glu	
210 215 220	
tgc aac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac	720
Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr	
225 230 235 240	
agg cag tac tgc cgc cag ctc ggc gtc gac ccc ggg ccc aac ctc acc	768
Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr	
245 250 255	
tgc tga	774
Cys *	

<210> 8

<211> 257

<212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 8
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45
 Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser
 50 55 60
 Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys
 65 70 75 80
 Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Asn Ala Tyr Pro
 85 90 95
 Gly Phe Ala His Gly Gly Thr Glu Val Glu Gly Lys Arg Glu Ile Ala
 100 105 110
 Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
 115 120 125
 Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Ala Ser Asn Arg Gln
 130 135 140
 Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
 145 150 155 160
 Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ser Leu Gly Phe
 165 170 175
 Asp Gly Leu Gly Asp Pro Asp Ala Val Ala Arg Ser Ala Val Leu Ala
 180 185 190
 Phe Arg Ser Ala Leu Trp Tyr Trp Met Asn Asn Val His Gly Val Val
 195 200 205
 Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala Leu Glu
 210 215 220
 Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
 225 230 235 240
 Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
 245 250 255
 Cys

<210> 9
 <211> 756
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(756)

<400> 9
 tcg acg cag aac tgc ggc tgc gcg tcg ggc ctg tgc tgc agc cgg ttc 48
 Ser Thr Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
 1 5 10 15
 ggc tac tgc ggc acg acc gac gcc tac tgc ggc gac ggg tgc cag tcg 96
 Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30

ggc ccg tgc cgc tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala	
35 40 45	
aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag agc	192
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser	
50 55 60	
cag gcc ggg agc ggg tgc gag ggc aag aat ttc tac acc cgg agc gcg	240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala	
65 70 75 80	
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg tcg	288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser	
85 90 95	
gag gtg gag ggc aag cgc gag atc gcc gcc ttc ttc gcg cac gtc acg	336
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr	
100 105 110	
cac gag acc ggg cat ttc tgc tac atc aac gag atc gac ggg ccg agc	384
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asp Gly Pro Ser	
115 120 125	
aag aac tac tgc gac cgg aac aac acg cag tgg ccg tgc cag gcg ggg	432
Lys Asn Tyr Cys Asp Arg Asn Asn Thr Gln Trp Pro Cys Gln Ala Gly	
130 135 140	
aag ggg tac tac ggc cgc ggc ccg ctg cag atc tcg tgg aac tac aac	480
Lys Gly Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn	
145 150 155 160	
tac ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc	528
Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro	
165 170 175	
ggc agg gtg gcg cgg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg	576
Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp	
180 185 190	
ttc tgg atg aag aac atg cac cag ctc atg ccc cag ggg ttc ggc gcc	624
Phe Trp Met Lys Asn Met His Gln Leu Met Pro Gln Gly Phe Gly Ala	
195 200 205	
acc atc agg gcc atc aac ggc gcc ctc gag tgc aac ggg aac aac ccc	672
Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro	
210 215 220	
gcc cag atg aac gcg cgc gtc ggc tac tac agg cag tac tgc cgc cag	720
Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln	
225 230 235 240	
ctc ggc gtc gac ccg ggc aac aac ctc acc tgc tga	756
Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys *	
245 250	

<210> 10
 <211> 251
 <212> PRT
 <213> Artificial Sequence
 <220>

<223> Variant sequence produced by shuffling techniques

<400> 10

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Ser Thr Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
 1          5          10          15
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
 20          25          30
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala
 35          40          45
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser
 50          55          60
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
 65          70          75          80
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
 85          90          95
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
100          105          110
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asp Gly Pro Ser
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          115          120          125
Lys Asn Tyr Cys Asp Arg Asn Asn Thr Gln Trp Pro Cys Gln Ala Gly
 130          135          140
Lys Gly Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn
145          150          155          160
Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro
 165          170          175
Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp
 180          185          190
Phe Trp Met Lys Asn Met His Gln Leu Met Pro Gln Gly Phe Gly Ala
 195          200          205
Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro
 210          215          220
Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln
225          230          235          240
Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys
 245          250
```

<210> 11

<211> 774

<212> DNA

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(774)

<400> 11

```
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt   48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1          5          10          15

ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg   96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20          25          30

ggc ccg tgc cgc tcg ggc ggc ggt ggc ggc ggc ggc ggc ggc gga ggc   144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
```

35	40	45	
ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala 50 55 60			192
ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys 65 70 75 80			240
aac ttc tac acc cgg agc gcg ttc ctc gag gcc atc gcc gcg tac ccg Asn Phe Tyr Thr Arg Ser Ala Phe Leu Glu Ala Ile Ala Ala Tyr Pro 85 90 95			288
ggc ttc gcg cat ggc ggc tcc gag gtc gag cgc aag cgc gag att gcc Gly Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala 100 105 110			336
gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile 115 120 125			384
agc gag gtc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag Ser Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln 130 135 140			432
tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag Trp Pro Cys Ala Ala Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln 145 150 155 160			480
atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe 165 170 175			528
gac ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala 180 185 190			576
ttc aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met 195 200 205			624
ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu 210 215 220			672
tgc aac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr 225 230 235 240			720
agg cag tac tgc cgc cag ctc ggc gtc gac ccg ggc aac aac ctc acc Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu Thr 245 250 255			768
tgc tga Cys *			774

<210> 12
 <211> 257
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 12

```
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1          5          10          15
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
          20          25          30
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
          35          40          45
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
          50          55          60
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
65          70          75          80
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Glu Ala Ile Ala Ala Tyr Pro
          85          90          95
Gly Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala
          100          105          110
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
          115          120          125
Ser Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
          130          135          140
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
145          150          155          160
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
          165          170          175
Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala
          180          185          190
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met
          195          200          205
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu
          210          215          220
Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
225          230          235          240
Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu Thr
          245          250          255
Cys
```

<210> 13

<211> 756

<212> DNA

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(756)

<400> 13

```
tcg atg cag aac tgc ggc tgc gcg tcg ggc ctg tgc tgc agc cgg ttc    48
Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
 1          5          10          15

ggc tac tgc ggc acg acc gac gcc tac tgc ggc gac ggg tgc cag tcg    96
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
          20          25          30

ggc ccg tgc cgc tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg    144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala
```

35	40	45	
aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag agc			192
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser			
50	55	60	
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg			240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala			
65	70	75	80
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg tcg			288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser			
	85	90	95
gag gtg gag ggc aag cgc gag atc gcc gcc ttc ttc gcg cac gtc acg			336
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr			
	100	105	110
cac gag acc ggg cat ttc tgc tac atc aac gag atc gac ggg ccg agc			384
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asp Gly Pro Ser			
	115	120	125
aag aac tac tgc gac cgg aac aac acg cag tgg ccg tgc cag gcg ggg			432
Lys Asn Tyr Cys Asp Arg Asn Asn Thr Gln Trp Pro Cys Gln Ala Gly			
	130	135	140
aag ggg tac tac ggc cgc ggc ccg ctg cag atc tcg tgg aac tac aac			480
Lys Gly Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn			
	145	150	155
tac ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc			528
Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro			
	165	170	175
ggc agg gtg gcg cgg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg			576
Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp			
	180	185	190
ttc tgg atg aag aac atc cac cag ctc atg ccc cag ggg ttc ggc gcc			624
Phe Trp Met Lys Asn Ile His Gln Leu Met Pro Gln Gly Phe Gly Ala			
	195	200	205
acc atc agg gcc atc aac ggc gcc ctc gag tgc aac ggg aac aac ccc			672
Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro			
	210	215	220
gcc cag atg aac gcg cgc gtc ggc tac tac agg cag tac tgc cgc cag			720
Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln			
	225	230	235
ctc ggc gtc gac ccg ggc aac aac ctc acc tgc tga			756
Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys *			
	245	250	

<210> 14

<211> 251

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

```

<400> 14
Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
 1          5          10          15
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
          20          25          30
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala
          35          40          45
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser
          50          55          60
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
          65          70          75          80
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
          85          90          95
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
          100          105          110
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asp Gly Pro Ser
          115          120          125
Lys Asn Tyr Cys Asp Arg Asn Asn Thr Gln Trp Pro Cys Gln Ala Gly
          130          135          140
Lys Gly Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn
          145          150          155          160
Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro
          165          170          175
Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp
          180          185          190
Phe Trp Met Lys Asn Ile His Gln Leu Met Pro Gln Gly Phe Gly Ala
          195          200          205
Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro
          210          215          220
Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln
          225          230          235          240
Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys
          245          250

```

```

<210> 15
<211> 777
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Variant sequence produced by shuffling techniques

```

```

<221> CDS
<222> (1)...(777)

```

```

<400> 15
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc      48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1          5          10          15

ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tca      96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
          20          25          30

ggc ccg tgc cgc tcg ggc ggc ggt ggc ggc ggc ggc ggc ggc gga ggc      144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
          35          40          45

ggc gga ggc agt ggc ggg gcg aac gtg gct agc gtc gtc acc ggc tcc      192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser
          50          55          60

```

ttc ttc aac ggc atc aag agc cag gcc ggg agc ggg tgc gag ggc aag	240
Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys	
65 70 75 80	
aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca	288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro	
85 90 95	
ggc ttc gcc cat ggc ggg tcg gag gtg gag ggc aag cgc gag atc gcc	336
Gly Phe Ala His Gly Gly Ser Glu Val Glu Gly Lys Arg Glu Ile Ala	
100 105 110	
gcc ttc ttc gcg cac gtc acg cac gag acc ggg cat ttc tgc tac atc	384
Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile	
115 120 125	
aac gag atc gac ggg ccg agc aag aac tac tgc gac cgg aac aac acg	432
Asn Glu Ile Asp Gly Pro Ser Lys Asn Tyr Cys Asp Arg Asn Asn Thr	
130 135 140	
cag tgg ccg tgc cag gcg ggg aag ggg tac tac ggc cgc ggc ccg ctg	480
Gln Trp Pro Cys Gln Ala Gly Lys Gly Tyr Tyr Gly Arg Gly Pro Leu	
145 150 155 160	
cag atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc	528
Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly	
165 170 175	
ttc gac ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gta	576
Phe Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val	
180 185 190	
gcg ttc aag gcg gcg ctc tgg ttc tgg atg aag aac atg cac cag ctc	624
Ala Phe Lys Ala Ala Leu Trp Phe Trp Met Lys Asn Met His Gln Leu	
195 200 205	
atg ccc cag ggg ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc	672
Met Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu	
210 215 220	
gag tgc aac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac	720
Glu Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr	
225 230 235 240	
tac agg cag tac tgc cgc cag ctc ggc gtc gac ccg ggc aac aac ctc	768
Tyr Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu	
245 250 255	
acc tgc tga	777
Thr Cys *	

<210> 16
 <211> 258
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 16
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe

1				5					10					15			
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser		
			20					25					30				
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly
		35					40					45					
Gly	Gly	Gly	Ser	Gly	Gly	Ala	Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser		
	50					55				60							
Phe	Phe	Asn	Gly	Ile	Lys	Ser	Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys		
65					70					75					80		
Asn	Phe	Tyr	Thr	Arg	Ser	Ala	Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro		
				85					90					95			
Gly	Phe	Ala	His	Gly	Gly	Ser	Glu	Val	Glu	Gly	Lys	Arg	Glu	Ile	Ala		
		100						105					110				
Ala	Phe	Phe	Ala	His	Val	Thr	His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile		
		115					120					125					
Asn	Glu	Ile	Asp	Gly	Pro	Ser	Lys	Asn	Tyr	Cys	Asp	Arg	Asn	Asn	Thr		
	130					135					140						
Gln	Trp	Pro	Cys	Gln	Ala	Gly	Lys	Gly	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu		
145					150					155					160		
Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly		
				165					170					175			
Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly	Arg	Val	Ala	Arg	Asp	Ala	Val	Val		
		180						185					190				
Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met	Lys	Asn	Met	His	Gln	Leu		
	195						200				205						
Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu		
	210					215					220						
Glu	Cys	Asn	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr		
225					230					235					240		
Tyr	Arg	Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Asn	Asn	Leu		
				245					250					255			

Thr Cys

<210> 17
 <211> 280
 <212> PRT
 <213> Zea mays

<400> 17

Met	Ala	Asn	Ala	Pro	Arg	Ile	Leu	Ala	Leu	Gly	Leu	Leu	Ala	Leu	Leu		
1				5					10					15			
Cys	Ala	Ala	Ala	Gly	Pro	Ala	Ala	Ala	Gln	Asn	Cys	Gly	Cys	Gln	Pro		
			20					25					30				
Asn	Phe	Cys	Cys	Ser	Lys	Phe	Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Ala	Tyr		
	35						40					45					
Cys	Gly	Asp	Gly	Cys	Gln	Ser	Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly		
	50					55				60							
Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Ser	Gly	Gly	Ala	Asn	Val		
65					70					75					80		
Ala	Asn	Val	Val	Thr	Asp	Ala	Phe	Phe	Asn	Gly	Ile	Lys	Asn	Gln	Ala		
				85					90					95			
Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala	Phe	Leu		
			100					105					110				
Ser	Ala	Val	Asn	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Thr	Glu	Val		
	115						120					125					
Glu	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Val	Thr	His	Glu		
	130					135					140						
Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Asn	Lys	Ser	Asn	Ala	Tyr		
145					150					155					160		
Cys	Asp	Ala	Ser	Asn	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln	Lys	Tyr		
				165					170					175			

Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro
 180 185 190
 Ala Gly Arg Asp Ile Gly Phe Asn Gly Leu Ala Asp Pro Asn Arg Val
 195 200 205
 Ala Gln Asp Ala Val Ile Ala Phe Lys Thr Ala Leu Trp Phe Trp Met
 210 215 220
 Asn Asn Val His Gly Val Met Pro Gln Gly Phe Gly Ala Thr Ile Arg
 225 230 235 240
 Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala Gln Met
 245 250 255
 Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Gln Gln Leu Arg Val
 260 265 270
 Asp Pro Gly Pro Asn Leu Ile Cys
 275 280

<210> 18
 <211> 269
 <212> PRT
 <213> Zea mays

<400> 18
 Pro Gln Leu Val Ala Leu Gly Leu Ala Leu Leu Cys Ala Val Ala Gly
 1 5 10 15
 Pro Ala Ala Ala Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser
 20 25 30
 Lys Phe Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys
 35 40 45
 Gln Ser Gly Pro Cys Arg Ser Gly Arg Gly Gly Gly Ser Gly Gly
 50 55 60
 Gly Gly Ala Asn Val Ala Ser Val Val Thr Ser Ser Phe Phe Asn Gly
 65 70 75 80
 Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr
 85 90 95
 Arg Ser Ala Phe Leu Ser Ala Val Lys Gly Tyr Pro Gly Phe Ala His
 100 105 110
 Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala
 115 120 125
 His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn
 130 135 140
 Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala
 145 150 155 160
 Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn
 165 170 175
 Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly
 180 185 190
 Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala
 195 200 205
 Leu Trp Phe Trp Met Asn Ser Val His Gly Val Val Pro Gln Gly Phe
 210 215 220
 Gly Ala Thr Thr Arg Ala Met Gln Arg Ala Leu Glu Cys Gly Gly Asn
 225 230 235 240
 Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys
 245 250 255
 Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
 260 265

<210> 19
 <211> 280
 <212> PRT
 <213> Zea mays

<400> 19

```

Met Ala Asn Ala Pro Arg Ile Leu Ala Leu Gly Leu Leu Ala Leu Leu
 1          5          10          15
Cys Ala Ala Ala Gly Pro Ala Ala Ala Gln Asn Cys Gly Cys Gln Pro
          20          25          30
Asn Phe Cys Cys Ser Lys Phe Gly Tyr Cys Gly Thr Thr Asp Ala Tyr
          35          40          45
Cys Gly Asp Gly Cys Gln Ser Gly Pro Cys Arg Ser Gly Gly Gly Gly
          50          55          60
Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Ser Gly Gly Ala Asn Val
65          70          75          80
Ala Asn Val Val Thr Asp Ala Phe Phe Asn Gly Ile Lys Asn Gln Ala
          85          90          95
Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu
          100          105          110
Ser Ala Val Asn Ala Tyr Pro Gly Phe Ala His Gly Gly Thr Glu Val
          115          120          125
Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr His Glu
          130          135          140
Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala Tyr
145          150          155          160
Cys Asp Ala Ser Asn Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr
          165          170          175
Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro
          180          185          190
Ala Gly Arg Asp Ile Gly Phe Asn Gly Leu Ala Asp Pro Asn Arg Val
          195          200          205
Ala Gln Asp Ala Val Ile Ala Phe Lys Thr Ala Leu Trp Phe Trp Met
          210          215          220
Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr Ile Arg
225          230          235          240
Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala Gln Met
          245          250          255
Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Gln Gln Leu Arg Val
          260          265          270
Asp Pro Gly Pro Asn Leu Ile Cys
          275          280

```

<210> 20

<211> 270

<212> PRT

<213> Zea mays

<400> 20

```

Pro Gln Leu Val Ala Leu Gly Leu Ala Leu Leu Cys Ala Val Ala Gly
 1          5          10          15
Pro Ala Ala Ala Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser
          20          25          30
Lys Phe Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys
          35          40          45
Gln Ser Gly Pro Cys Arg Ser Gly Arg Gly Gly Gly Ser Gly Gly
          50          55          60
Gly Gly Ala Asn Val Ala Ser Val Val Thr Ser Ser Phe Phe Asn Gly
65          70          75          80
Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr
          85          90          95
Arg Ser Ala Phe Leu Ser Ala Val Asn Lys Gly Tyr Pro Gly Phe Ala
          100          105          110
His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe
          115          120          125
Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile
130          135          140

```

Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys
145					150					155					160
Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp
				165					170						175
Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu
			180					185					190		
Phe	Asp	Pro	Phe	Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala
	195						200					205			
Ala	Leu	Trp	Phe	Trp	Met	Asn	Ser	Val	His	Gly	Val	Val	Pro	Gln	Gly
	210					215					220				
Phe	Gly	Ala	Thr	Thr	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Gly	Gly
225					230					235					240
Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Arg	Gln	Tyr
				245				250						255	
Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys		
			260					265					270		

<210> 21
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(753)

<400> 21																
tcg	atg	cag	aac	tgc	ggg	tgc	gcg	tcg	ggc	ctg	tgc	tgc	agc	cgg	ttc	48
Ser	Met	Gln	Asn	Cys	Gly	Cys	Ala	Ser	Gly	Leu	Cys	Cys	Ser	Arg	Phe	
1				5					10					15		
ggg tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg																96
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser	
			20					25					30			
ggc ccg tgc cgc tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg																144
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Ala	
		35					40					45				
aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag agc																192
Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Ser	
	50					55					60					
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg																240
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala	
	65				70				75						80	
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg tcg																288
Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Ser	
				85				90						95		
cag gtg cag ggc aag cgc gag atc gcc gcc ttc ttc gcg cac gcc acg																336
Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Ala	Thr	
			100					105					110			
cac gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac																384
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Asn	Lys	Ser	Asn	
		115					120					125				
gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag																432

Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln	
130						135					140					
aag	tac	tac	ggg	cgc	ggc	ccg	ctg	cag	atc	tcg	tgg	aac	tac	aac	tac	480
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr	
145					150					155					160	
ggg	ccc	gcg	ggg	agg	gcc	atc	ggc	ttc	gac	ggg	ctc	ggg	gac	ccc	ggc	528
Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly	
				165					170					175		
agg	gtg	gcg	cgg	gac	gcc	gtg	gtg	gcg	ttc	aag	gcg	gcg	ctc	tgg	ttc	576
Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe	
			180					185					190			
tgg	atg	aac	aac	gtg	cac	cgt	gtg	atg	ccg	cag	ggc	ttc	ggc	gcc	acc	624
Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr	
		195				200					205					
atc	agg	gcc	atc	aac	ggc	gcg	ctc	gag	tgc	aac	ggg	aac	aac	ccc	gcc	672
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asn	Gly	Asn	Asn	Pro	Ala	
	210					215					220					
cag	atg	aac	gcg	cgc	gtc	ggc	tac	tac	aag	cag	tac	tgc	cag	cag	ctc	720
Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Lys	Gln	Tyr	Cys	Gln	Gln	Leu	
225					230					235					240	
cgc	gtc	gac	cca	ggg	ccc	aac	ctc	acc	tgc	tga						753
Arg	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	*						
				245					250							

<210> 22

<211> 250

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 22

Ser	Met	Gln	Asn	Cys	Gly	Cys	Ala	Ser	Gly	Leu	Cys	Cys	Ser	Arg	Phe	
1			5						10					15		
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser	
		20						25					30			
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Ala	
		35				40						45				
Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Ser	
	50					55					60					
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala	
65				70					75					80		
Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Ser	
			85						90					95		
Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Ala	Thr	
		100						105					110			
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Asn	Lys	Ser	Asn	
	115					120						125				
Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln	
	130					135					140					
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr	
145					150					155					160	
Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly	
			165						170						175	

Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe	
		180						185					190			
Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr	
		195					200					205				
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asn	Gly	Asn	Asn	Pro	Ala	
	210				215						220					
Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Lys	Gln	Tyr	Cys	Gln	Gln	Leu	
225				230						235					240	
Arg	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys							
			245					250								

<210> 23
 <211> 774
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(774)

<400> 23																
tgc	atg	cag	aac	tgc	ggc	tgc	cag	cca	aac	gta	tgc	tgc	agc	aag	ttt	48
Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe	
1				5					10					15		
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg																96
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser	
			20				25						30			
ggc ccg tgc cgc tcg ggc ggc ggc ggc agc agt ggc ggc ggc gga ggc																144
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Gly	
			35				40					45				
ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg																192
Gly	Gly	Gly	Ser	Gly	Gly		55	Asn	Val	Ala	Asn	Val	Val	Thr	Asp	Ala
			50				55				60					
ttc ttc aac ggc atc aag aac cag gcc ggg agc tgg tgc gag ggc aag																240
Phe	Phe	Asn	Gly	Ile	Lys	Asn	Gln	Ala	Gly	Ser	Trp	Cys	Glu	Gly	Lys	
			65			70				75					80	
aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca																288
Asn	Phe	Tyr	Thr	Arg	Ser	Ala	Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	
				85					90					95		
ggc ttc gcc cat ggc ggg tcg cag gtg cag ggc aag cgc gag atc gcc																336
Gly	Phe	Ala	His	Gly	Gly	Ser	Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	
			100				105						110			
gcc ttc ttc gcg cat gtc acg cac gag acc ggg cat ttg tgc tac atc																384
Ala	Phe	Phe	Ala	His	Val	Thr	His	Glu	Thr	Gly	His	Leu	Cys	Tyr	Ile	
			115				120					125				
aac gag gtc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag																432
Asn	Glu	Val	Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	
			130			135					140					
tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag																480
Trp	Pro	Cys	Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	
					150					155					160	

atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc	528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe	
165 170 175	
gac ggg ctg gga gac ccg gac aga ctg gcg cag gac ccc gtg ttg tcg	576
Asp Gly Leu Gly Asp Pro Asp Arg Leu Ala Gln Asp Pro Val Leu Ser	
180 185 190	
ttc aag tcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg	624
Phe Lys Ser Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met	
195 200 205	
ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag	672
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu	
210 215 220	
tgc ggc ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac	720
Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr	
225 230 235 240	
agg cag tac tgc cgc cag ctc ggc gtc gac ccg ggc aac aac ctc acc	768
Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu Thr	
245 250 255	
tgc tga	774
Cys *	

<210> 24
 <211> 257
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 24

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Gly	
35 40 45	
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala	
50 55 60	
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Trp Cys Glu Gly Lys	
65 70 75 80	
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro	
85 90 95	
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala	
100 105 110	
Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Leu Cys Tyr Ile	
115 120 125	
Asn Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln	
130 135 140	
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln	
145 150 155 160	
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe	
165 170 175	
Asp Gly Leu Gly Asp Pro Asp Arg Leu Ala Gln Asp Pro Val Leu Ser	
180 185 190	

Phe Lys Ser Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met
 195 200 205
 Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu
 210 215 220
 Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
 225 230 235 240
 Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu Thr
 245 250 255
 Cys

<210> 25
 <211> 765
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(765)

<400> 25
 tcg atg cag aac tgc ggg tgc gcg tcg ggc ctg tgc tgc agc cgg ttc 48
 Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe
 1 5 10 15

 ggg tac tgc ggg acg ggc gag gac tac tgc ggc gcc ggg tgc cag tcg 96
 Gly Tyr Cys Gly Thr Gly Glu Asp Tyr Cys Gly Ala Gly Cys Gln Ser
 20 25 30

 ggc ccg tgc cgc tcg ggc ggc ggc ggc ggc ggc gga ggc ggc gga ggc 144
 Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45

 agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg ttc ttc aac 192
 Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn
 50 55 60

 ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac 240
 Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr
 65 70 75 80

 acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcg 288
 Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala
 85 90 95

 cat ggc ggc tcc gag gtc gag cgc aag cgc gag att gcc gcc ttc ttc 336
 His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe
 100 105 110

 gcg cat gtc acg cac gag acc ggg cat ttc tgc tac atc agc gag atc 384
 Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile
 115 120 125

 aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc 432
 Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys
 130 135 140

 gcc gcg ggg cag aag tac tac ggc cgc ggc ccg ctg cag atc tcc tgg 480
 Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp
 145 150 155 160

aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctg	528
Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu	
165 170 175	
gga gac ccg gac aga ctg gcg cag gac ccc gtg ttg tct ttc aag gcg	576
Gly Asp Pro Asp Arg Leu Ala Gln Asp Pro Val Leu Ser Phe Lys Ala	
180 185 190	
gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg ccg cag ggc	624
Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly	
195 200 205	
ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag tgc aac ggg	672
Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly	
210 215 220	
aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac agg cag tac	720
Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr	
225 230 235 240	
tgc cgc cag ctc ggc gtc gac ccg ggc aac aac ctc acc tgc tga	765
Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys *	
245 250	

<210> 26
 <211> 254
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 26

Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Leu Cys Cys Ser Arg Phe	
1 5 10 15	
Gly Tyr Cys Gly Thr Gly Glu Asp Tyr Cys Gly Ala Gly Cys Gln Ser	
20 25 30	
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn	
50 55 60	
Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr	
65 70 75 80	
Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala	
85 90 95	
His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe	
100 105 110	
Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile	
115 120 125	
Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys	
130 135 140	
Ala Ala Gly Gln Lys Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp	
145 150 155 160	
Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu	
165 170 175	
Gly Asp Pro Asp Arg Leu Ala Gln Asp Pro Val Leu Ser Phe Lys Ala	
180 185 190	
Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly	
195 200 205	
Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly	

210	215	220
Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr		
225	230	235
Cys Arg Gln Leu Gly Val Asp Pro Gly Asn Asn Leu Thr Cys		240
	245	250

<210> 27
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(753)

<400> 27

tcg atg cag aac tgc ggc tgc cag cca aac ttc tgc tgc agc aag ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gcc tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg	144
Gly Pro Cys Arg Ser Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala	
35 40 45	
aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag agc	192
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Ser	
50 55 60	
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg	240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala	
65 70 75 80	
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggc tcc	288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser	
85 90 95	
gag gtc gag cgc aag cgc gag att gcc gcc ttc ttc gcg cat gtc acg	336
Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr	
100 105 110	
cac gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac	384
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn	
115 120 125	
gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag	432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln	
130 135 140	
aag tac tac ggg cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac	480
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr	
145 150 155 160	
ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc ggc	528
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly	
165 170 175	

agg	gtg	gcg	cgg	gac	gcc	gtg	gtg	gcg	ttc	aag	gcg	gcg	ctc	tgg	ttc	576
Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe	
		180						185					190			
tgg	atg	aac	aac	gtg	cac	cgt	gtg	atg	ccg	cag	ggc	ttc	ggc	gcc	acc	624
Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr	
		195					200					205				
atc	agg	gcc	atc	aac	ggc	gcc	ctc	gag	tgc	gac	ggc	aag	aac	ccc	aac	672
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asp	Gly	Lys	Asn	Pro	Asn	
		210				215					220					
tcc	gtc	aac	aac	cgc	gtc	gcc	tac	tac	aag	cag	ttc	tgc	cag	gat	ttc	720
Ser	Val	Asn	Asn	Arg	Val	Ala	Tyr	Tyr	Lys	Gln	Phe	Cys	Gln	Asp	Phe	
		225				230				235					240	
ggc	gtc	gac	cca	ggg	ccc	aac	ctt	act	tgc	tga						753
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	*						
				245					250							

<210> 28
 <211> 250
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 28

Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Phe	Cys	Cys	Ser	Lys	Phe	
1				5					10					15		
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Ala	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser	
			20					25					30			
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Ala	
		35				40						45				
Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Ser	
	50					55					60					
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala	
65					70				75						80	
Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Ser	
			85					90					95			
Glu	Val	Glu	Arg	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Val	Thr	
			100					105					110			
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Asn	Lys	Ser	Asn	
		115					120					125				
Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln	
	130					135					140					
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr	
145					150				155					160		
Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly	
			165					170						175		
Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe	
		180						185					190			
Trp	Met	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr		
		195				200					205					
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asp	Gly	Lys	Asn	Pro	Asn	
	210					215					220					
Ser	Val	Asn	Asn	Arg	Val	Ala	Tyr	Tyr	Lys	Gln	Phe	Cys	Gln	Asp	Phe	
225					230					235					240	
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys							
				245					250							

<210> 29
 <211> 774
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(774)

<400> 29
 tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt 48
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15

ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg 96
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30

ggc ccg tgc cgc tcg ggc ggc ggt ggc ggc ggc ggc ggc ggc gga ggc 144
 Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45

ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg 192
 Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
 50 55 60

ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag 240
 Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
 65 70 75 80

aac ttc tac acc cgg agc gcg ttc ctc gag gcc atc gcc gcg tac ccg 288
 Asn Phe Tyr Thr Arg Ser Ala Phe Leu Glu Ala Ile Ala Ala Tyr Pro
 85 90 95

ggc ttc gcg cat ggc ggc tcc gag gtc gag cgc aag cgc gag att gcc 336
 Gly Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala
 100 105 110

gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc 384
 Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
 115 120 125

agc gag gtc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag 432
 Ser Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
 130 135 140

tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag 480
 Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
 145 150 155 160

atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc 528
 Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
 165 170 175

gac ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg 576
 Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala
 180 185 190

ttc aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg 624
 Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met

195					200					205						
ccg	cag	ggc	ttc	ggc	gcc	acc	atc	agg	gcc	atc	aac	ggc	gcc	ctc	gag	672
Pro	Gln	Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	
	210					215					220					
tgc	ggc	ggg	aac	aac	ccc	gcc	cag	atg	aac	gcg	cgc	gtc	ggc	tac	tac	720
Cys	Gly	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	
225					230					235				240		
aag	cag	tac	tgc	cgc	cag	ctc	ggc	gtc	gac	cca	ggg	ccc	aac	ctc	act	768
Lys	Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	
				245					250					255		
tgc	tga															774
Cys	*															

<210> 30
 <211> 257
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 30

Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe	
1				5					10					15		
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser	
			20				25						30			
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	
		35					40					45				
Gly	Gly	Gly	Ser	Gly	Gly	Ala	Asn	Val	Ala	Asn	Val	Val	Thr	Asp	Ala	
	50					55					60					
Phe	Phe	Asn	Gly	Ile	Lys	Asn	Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	
65				70						75				80		
Asn	Phe	Tyr	Thr	Arg	Ser	Ala	Phe	Leu	Glu	Ala	Ile	Ala	Ala	Tyr	Pro	
			85					90						95		
Gly	Phe	Ala	His	Gly	Gly	Ser	Glu	Val	Glu	Arg	Lys	Arg	Glu	Ile	Ala	
		100					105						110			
Ala	Phe	Phe	Ala	His	Ala	Thr	His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	
	115					120					125					
Ser	Glu	Val	Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	
	130					135					140					
Trp	Pro	Cys	Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	
145					150					155				160		
Ile	Ser	Trp	Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	
			165				170							175		
Asp	Gly	Leu	Gly	Asp	Pro	Gly	Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	
		180					185						190			
Phe	Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	
	195					200					205					
Pro	Gln	Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	
	210					215					220					
Cys	Gly	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	
225					230					235				240		
Lys	Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	
				245					250					255		

Cys

<210> 31
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(753)

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<400> 31
tcg atg cag aac tgc ggc tgc cag cca aac ttc tgc tgc agc aag ttt 48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
  1          5          10          15

ggc tac tgc ggc acg acc gac gag tac tgc ggc gcc ggg tgc cag tcg 96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser
          20          25          30

ggc ccg tgc cgc tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg 144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala
          35          40          45

aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag aac 192
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn
          50          55          60

cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg 240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
          65          70          75          80

ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggc tcc 288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
          85          90          95

gag gtc gag cgc aag cgc gag atc gcc gcc ttc ttc gcg cac gcc acg 336
Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr
          100          105          110

cat gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac 384
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
          115          120          125

gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag 432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
          130          135          140

aag tac tac ggg cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac 480
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
          145          150          155          160

ggg ccc gcg ggg agg gcc atc ggc ttt gac ggc ctc ggg gac ccc ggc 528
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
          165          170          175

agg gtg gcg cag gac ccc gtg ctg gcg ttc aag gcg gcg ctc tgg ttc 576
Arg Val Ala Gln Asp Pro Val Leu Ala Phe Lys Ala Ala Leu Trp Phe
          180          185          190

tgg atg aac agc gtg cac ggg gtg gtg ccg cag ggc ttc ggc gcc acc 624
Trp Met Asn Ser Val His Gly Val Val Pro Gln Gly Phe Gly Ala Thr
  
```

195	200	205	
atc agg gcc atc aac ggc gcc ctc gag tgc aac ggg aac aac ccc gcc			672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala			
210	215	220	
cag atg aac gcg cgc gtc ggc tac tac aag cag ttc tgc cag gat ttc			720
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Phe Cys Gln Asp Phe			
225	230	235	240
ggc gtc gac cca ggg ccc aac ctc act tgc tga			753
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys *			
245	250		

<210> 32
 <211> 250
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 32

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe			
1	5	10	15
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser			
20	25	30	
Gly Pro Cys Arg Ser Gly Gly Gly Ser Ser Gly Gly Gly Ala			
35	40	45	
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn			
50	55	60	
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala			
65	70	75	80
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser			
85	90	95	
Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr			
100	105	110	
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn			
115	120	125	
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln			
130	135	140	
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr			
145	150	155	160
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly			
165	170	175	
Arg Val Ala Gln Asp Pro Val Leu Ala Phe Lys Ala Ala Leu Trp Phe			
180	185	190	
Trp Met Asn Ser Val His Gly Val Val Pro Gln Gly Phe Gly Ala Thr			
195	200	205	
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala			
210	215	220	
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Phe Cys Gln Asp Phe			
225	230	235	240
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys			
245	250		

<210> 33
 <211> 774
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(774)

<400> 33

tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc aca acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tcg ggc ggc ggt ggc ggc ggc ggc ggc ggc gga ggc	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg	192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala	
50 55 60	
ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag	240
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys	
65 70 75 80	
aac ttc tac acc cgg agc gcg ttc ctc gag gcc atc gcc gcg tac ccg	288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Glu Ala Ile Ala Ala Tyr Pro	
85 90 95	
ggc ttc gcg cat ggc ggc tcc gag gtc gag cgc aag cgc gag att gcc	336
Gly Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala	
100 105 110	
gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc	384
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile	
115 120 125	
agc gag gtc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag	432
Ser Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln	
130 135 140	
tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag	480
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln	
145 150 155 160	
atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc	528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe	
165 170 175	
gac ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg	576
Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala	
180 185 190	
ttc aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg	624
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met	
195 200 205	
ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag	672
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu	
210 215 220	

tgc ggc ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac	720
Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr	
225 230 235 240	
aag cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act	768
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr	
245 250 255	
tgc tga	774
Cys *	

<210> 34
 <211> 257
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 34

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala	
50 55 60	
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys	
65 70 75 80	
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Glu Ala Ile Ala Ala Tyr Pro	
85 90 95	
Gly Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala	
100 105 110	
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile	
115 120 125	
Ser Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln	
130 135 140	
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln	
145 150 155 160	
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe	
165 170 175	
Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala	
180 185 190	
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met	
195 200 205	
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu	
210 215 220	
Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr	
225 230 235 240	
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr	
245 250 255	

Cys

<210> 35
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(753)

<400> 35

tcg atg cag aac tgc ggc tgc cag cca aac ttc tgc tgc agc aag ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tgc	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gtg	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Val	
35 40 45	
aac gtg gct agc gtc gtc acc gac tcc ttc ttc aac ggc atc aag agc	192
Asn Val Ala Ser Val Val Thr Asp Ser Phe Phe Asn Gly Ile Lys Ser	
50 55 60	
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg	240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala	
65 70 75 80	
ttc ctg agc gcc gtc aac gcg tac ccg ggc ttc gcc cat ggc ggg acg	288
Phe Leu Ser Ala Val Asn Ala Tyr Pro Gly Phe Ala His Gly Gly Thr	
85 90 95	
gag gtg gag ggc aag cgc gag atc gcc gcc ttc ttc gcg cac gcc acg	336
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr	
100 105 110	
cac gag acc ggg cat ttc tgc tac atc aac gag atc aac aag agc aac	384
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asn Lys Ser Asn	
115 120 125	
gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag	432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln	
130 135 140	
aag tac tac ggg cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac	480
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr	
145 150 155 160	
ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc ggc	528
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly	
165 170 175	
agg gtg gcg ccg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg ttc	576
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe	
180 185 190	
tgg atg aac aac gtg cac cgt gtg atg ccg cag ggc ttc ggc gcc acc	624
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr	
195 200 205	
atc agg gcc atc aac ggc gcc ctc gag tgc aac ggg aac aac ccc gcc	672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala	

210

215

220

```

cag atg aac gcg cgc gtc ggc tac tac aag cag tac tgc cag cag ctc 720
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Gln Gln Leu
225                230                235                240

```

```

cgc gtc gac cca ggg ccc aac ctc act tgc tga 753
Arg Val Asp Pro Gly Pro Asn Leu Thr Cys *
                245                250

```

<210> 36

<211> 250

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 36

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Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
 1          5          10          15
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
          20          25          30
Gly Pro Cys Arg Ser Gly Gly Gly Ser Ser Gly Gly Gly Gly Val
          35          40          45
Asn Val Ala Ser Val Val Thr Asp Ser Phe Phe Asn Gly Ile Lys Ser
          50          55          60
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
65          70          75          80
Phe Leu Ser Ala Val Asn Ala Tyr Pro Gly Phe Ala His Gly Gly Thr
          85          90          95
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr
          100         105         110
His Glu Thr Gly His Phe Cys Tyr Ile Asn Glu Ile Asn Lys Ser Asn
          115         120         125
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
          130         135         140
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
145          150         155         160
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
          165         170         175
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
          180         185         190
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
          195         200         205
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asn Gly Asn Asn Pro Ala
          210         215         220
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Gln Gln Leu
225          230         235         240
Arg Val Asp Pro Gly Pro Asn Leu Thr Cys
          245         250

```

<210> 37

<211> 774

<212> DNA

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(774)

<400> 37

tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc ccg ggc ggc ggc ggc ggc ggc ggc ggc ggc gga ggc	144
Gly Pro Cys Arg Pro Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg	192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala	
50 55 60	
ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag	240
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys	
65 70 75 80	
aac ttc tac acc cgg aga gcg ttc ctg agc gcc gtc aag gcg tac cca	288
Asn Phe Tyr Thr Arg Arg Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro	
85 90 95	
ggc ttc gcc cat ggc ggg tcg cag gtg cag ggc aag cgc gag atc gcc	336
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala	
100 105 110	
gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc	384
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile	
115 120 125	
agc gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag	432
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln	
130 135 140	
tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag	480
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln	
145 150 155 160	
atc tcg tgg aac tac aac tac ggg ccc gcc ggg agg gac atc ggc ttc	528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Asp Ile Gly Phe	
165 170 175	
aac ggg ctc gcc gac ccc aac agg gtg gcg cag gac gcc gtg gtg gcg	576
Asn Gly Leu Ala Asp Pro Asn Arg Val Ala Gln Asp Ala Val Val Ala	
180 185 190	
ttc aag gcg gcg ctc tgg ttc tgg atg aac agc gtg cac ggg gtg gtg	624
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Val	
195 200 205	
ccg cag ggg ttc ggc gcc acc acc agg gcc atc aac ggc gcc ctc gag	672
Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala Leu Glu	
210 215 220	

[illegible]

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(780)

<400> 39

tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cac tcg ggc ggc ggc ggc agc tgt ggc ggc ggt ggc ggc	144
Gly Pro Cys His Ser Gly Gly Gly Gly Ser Cys Gly Gly Gly Gly Gly	
35 40 45	
ggc agc ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc	192
Gly Ser Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr	
50 55 60	
ggc tcc ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag	240
Gly Ser Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu	
65 70 75 80	
ggc aag aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg	288
Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala	
85 90 95	
tac cca ggc ttc gcc cat ggc ggg tca cag gtg cag ggc aag cgc gag	336
Tyr Pro Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu	
100 105 110	
atc gcc gcc ttc ttc gcg cat gtc acg cac gag acc ggg cat ttc tgc	384
Ile Ala Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys	
115 120 125	
tac atc agc gag atc aac aag agc aac gcc tac tgc gac ccg acc aag	432
Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys	
130 135 140	
agg cag tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg	480
Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro	
145 150 155 160	
ctg cag atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc	528
Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile	
165 170 175	
ggc ttc gac ggg ctc ggg gac ccc ggc agg gtg gcg cag gac gcc gtg	576
Gly Phe Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Gln Asp Ala Val	
180 185 190	
atc gcg ttc aag tcg gcg ctc tgg tac tgg atg gag aac atg cac cag	624
Ile Ala Phe Lys Ser Ala Leu Trp Tyr Trp Met Glu Asn Met His Gln	
195 200 205	
ctc atg ccc cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc	672
Leu Met Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala	
210 215 220	

```

ctc gag tgc ggc ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc 720
Leu Glu Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly
225                230                235                240

tac tac aag cag tac tgc cac cag ctc ggc gtc gac cca ggg ccc aac 768
Tyr Tyr Lys Gln Tyr Cys His Gln Leu Gly Val Asp Pro Gly Pro Asn
245                250                255

ctc act tgc tga 780
Leu Thr Cys *
```

```

<210> 40
<211> 259
<212> PRT
<213> Artificial Sequence
```

```

<220>
<223> Variant sequence produced by shuffling techniques
```

```

<400> 40
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1          5          10          15
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
          20          25          30
Gly Pro Cys His Ser Gly Gly Gly Gly Ser Cys Gly Gly Gly Gly Gly
 35          40          45
Gly Ser Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr
 50          55          60
Gly Ser Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu
 65          70          75          80
Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala
          85          90          95
Tyr Pro Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu
          100          105          110
Ile Ala Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys
          115          120          125
Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys
          130          135          140
Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro
          145          150          155          160
Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile
          165          170          175
Gly Phe Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Gln Asp Ala Val
          180          185          190
Ile Ala Phe Lys Ser Ala Leu Trp Tyr Trp Met Glu Asn Met His Gln
          195          200          205
Leu Met Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala
          210          215          220
Leu Glu Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly
          225          230          235          240
Tyr Tyr Lys Gln Tyr Cys His Gln Leu Gly Val Asp Pro Gly Pro Asn
          245          250          255
Leu Thr Cys
```

```

<210> 41
<211> 771
<212> DNA
<213> Artificial Sequence
```

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(771)

<400> 41

tcg atg cag aac tgc ggg tgc gcg tcg ggc atg tgc tgc agc cgg ttc	48
Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Met Cys Cys Ser Arg Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tcg ggc ggc ggc ggc ggc ggc ggc ggc gga ggc ggc	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
gga ggc agt ggc ggt gcg aac gtg gct agc gtc gtc acc ggc tcc ttc	192
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe	
50 55 60	
ttc agc ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag aac	240
Phe Ser Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn	
65 70 75 80	
ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc	288
Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly	
85 90 95	
ttc gcc cat ggc ggg acg gag gtg gag ggc aag cgc gag atc gcc gcc	336
Phe Ala His Gly Gly Thr Glu Val Glu Gly Lys Arg Glu Ile Ala Ala	
100 105 110	
ttc ctc gcg cac atc acg cac gag acc ggg cat ttc tgc tac atc agc	384
Phe Leu Ala His Ile Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser	
115 120 125	
gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg	432
Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp	
130 135 140	
ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag atc	480
Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile	
145 150 155 160	
tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ctc gac	528
Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Leu Asp	
165 170 175	
ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg ttc	576
Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe	
180 185 190	
aag gcg gcg ctc tgg ttc tgg atg aac agc gtg cac ggg gtg atg ccc	624
Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Met Pro	
195 200 205	
cag ggg ttc ggc gcc acc atc agg gcc atc aac ggc gcg ctc gag tgc	672
Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys	

210	215	220	
gac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac aag			720
Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys			
225	230	235	240
cag tac tgc cag cag ctc cgc gtc gac ccg ggc aac aac ctc act tgc			768
Gln Tyr Cys Gln Gln Leu Arg Val Asp Pro Gly Asn Asn Leu Thr Cys			
	245	250	255
tga			771
*			

<210> 42
 <211> 256
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 42
 Ser Met Gln Asn Cys Gly Cys Ala Ser Gly Met Cys Cys Ser Arg Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45
 Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe
 50 55 60
 Phe Ser Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn
 65 70 75 80
 Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly
 85 90 95
 Phe Ala His Gly Gly Thr Glu Val Glu Gly Lys Arg Glu Ile Ala Ala
 100 105 110
 Phe Leu Ala His Ile Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser
 115 120 125
 Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp
 130 135 140
 Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile
 145 150 155 160
 Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Leu Asp
 165 170 175
 Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe
 180 185 190
 Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Met Pro
 195 200 205
 Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys
 210 215 220
 Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys
 225 230 235 240
 Gln Tyr Cys Gln Gln Leu Arg Val Asp Pro Gly Asn Asn Leu Thr Cys
 245 250 255

<210> 43
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(753)

<400> 43

tgc atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tgc	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tgc ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala	
35 40 45	
aac gtg gct aat gtg gtc acc gac gcg ttc ttc aac ggc atc aag aac	192
Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn Gly Ile Lys Asn	
50 55 60	
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg	240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala	
65 70 75 80	
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggc tcc	288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser	
85 90 95	
gag gtc gag cgc aag cgc gag att gcc gcc ttc ttc gcg cat gtc acg	336
Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr	
100 105 110	
cac gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac	384
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn	
115 120 125	
gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag	432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln	
130 135 140	
aag tac tac ggg cgc ggc ccg ctg cag atc tgc tgg aac tac aac tac	480
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr	
145 150 155 160	
ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc ggc	528
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly	
165 170 175	
agg gtg gcg ccg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg ttc	576
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe	
180 185 190	
tgg atg aac aac gtg cac cgt gtg atg ccg cag ggc ttc ggc gcc acc	624
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr	
195 200 205	
atc agg gcc atc aac ggc gcc ctc gag tgc ggc ggg aac aac ccc gcc	672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala	

210	215	220	
cag atg aac gcg cgc gtc ggc tac tac aag cag tac tgc cgc cag ctc			720
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu			
225	230	235	240

ggc gtc gac cca ggg ccc aac ctc act tgc tga	753
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys *	
245	250

<210> 44
 <211> 250
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 44
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala
 35 40 45
 Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn Gly Ile Lys Asn
 50 55 60
 Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
 65 70 75 80
 Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
 85 90 95
 Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
 100 105 110
 His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
 115 120 125
 Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
 130 135 140
 Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
 145 150 155 160
 Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
 165 170 175
 Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
 180 185 190
 Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
 195 200 205
 Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala
 210 215 220
 Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu
 225 230 235 240
 Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
 245 250

<210> 45
 <211> 774
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(774)

<400> 45

tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc cgg ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Arg Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cgg tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Arg Ser	
20 25 30	
ggc ccg tgc cgc tcg ggc ggc ggt ggc ggc ggc ggc ggc ggc gga ggc	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg	192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala	
50 55 60	
ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag	240
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys	
65 70 75 80	
aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca	288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro	
85 90 95	
ggc ttc gcc cat ggc ggg tcg cag gtg cag ggc aag cgc gag atc gcc	336
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala	
100 105 110	
gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc	384
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile	
115 120 125	
agc gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag	432
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln	
130 135 140	
tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag	480
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln	
145 150 155 160	
atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttt	528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe	
165 170 175	
gac ggg ctc ggg gac ccc aac agg gtg gcg cgg gac gcc gtg gtg gcg	576
Asp Gly Leu Gly Asp Pro Asn Arg Val Ala Arg Asp Ala Val Val Ala	
180 185 190	
ttc aag gcg gcg ctc tgg ttc tgg atg aac agc gtg cac ggg gtg gtg	624
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Val	
195 200 205	
ccg cag ggg ttc ggc gcc acc acc agg gcc atc aac ggc gcc ctc gag	672
Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala Leu Glu	
210 215 220	
tgc aac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac	720
Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr	
225 230 235 240	

aag	cag	tac	tgc	cgc	cag	ctc	ggc	gtc	gac	cca	ggg	ccc	aac	ctc	act	768
Lys	Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	
				245					250					255		

tgc	tga															774
Cys	*															

<210> 46
 <211> 257
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 46
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Arg Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Arg Ser
 20 25 30
 Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45
 Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
 50 55 60
 Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
 65 70 75 80
 Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro
 85 90 95
 Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala
 100 105 110
 Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile
 115 120 125
 Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln
 130 135 140
 Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln
 145 150 155 160
 Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe
 165 170 175
 Asp Gly Leu Gly Asp Pro Asn Arg Val Ala Arg Asp Ala Val Val Ala
 180 185 190
 Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly Val Val
 195 200 205
 Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala Leu Glu
 210 215 220
 Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr
 225 230 235 240
 Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr
 245 250 255
 Cys

<210> 47
 <211> 771
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(771)

<400> 47

tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tgc ggc ggc ggc ggc ggc ggc ggc ggc gga ggc ggc	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
gga ggc agt ggc ggt gcg aac gtg gct agc gtc gtc acc ggc tcc ttc	192
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe	
50 55 60	
ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag aac	240
Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn	
65 70 75 80	
ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc	288
Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly	
85 90 95	
ttc gcc cat ggc ggg tca cag gtg cag ggc aag cgc gag atc gcc gcc	336
Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala	
100 105 110	
ttc ttc gcg cat gtc acg cac gag acc ggg cat ttc cgc tac atc agc	384
Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Arg Tyr Ile Ser	
115 120 125	
gag gtc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg	432
Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp	
130 135 140	
ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag atc	480
Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile	
145 150 155 160	
tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttt gac	528
Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp	
165 170 175	
ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg ttc	576
Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe	
180 185 190	
aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg ccg	624
Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro	
195 200 205	
cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag tgc	672
Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys	
210 215 220	
ggc ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac agg	720
Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg	
225 230 235 240	

cag	tac	tgc	cgc	cag	ctc	ggc	gtc	gac	cca	ggg	ccc	aac	ctc	act	tgc	768
Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	
				245					250					255		

tga																771
*																

<210> 48
 <211> 256
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 48
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45
 Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe
 50 55 60
 Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn
 65 70 75 80
 Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly
 85 90 95
 Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala
 100 105 110
 Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Arg Tyr Ile Ser
 115 120 125
 Glu Val Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp
 130 135 140
 Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile
 145 150 155 160
 Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp
 165 170 175
 Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe
 180 185 190
 Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro
 195 200 205
 Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys
 210 215 220
 Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg
 225 230 235 240
 Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
 245 250 255

<210> 49
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(753)

<400> 49

tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tgc ggc ggc ggc ggc agc agt ggc ggc ggt ggt gtg	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Val	
35 40 45	
aac gtg gcc agc atc gtg acc ggc tcc ttc ttc aac ggc atc aag aac	192
Asn Val Ala Ser Ile Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn	
50 55 60	
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg	240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala	
65 70 75 80	
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg acg	288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Thr	
85 90 95	
gag gtg gag ggc aag cgc gag atc gcc gcc ttc ttc gcg cat gtc acg	336
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr	
100 105 110	
cat gag acc ggg cat ttc tgc tac atc agc gag atc agc aag agc aac	384
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Ser Lys Ser Asn	
115 120 125	
gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag	432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln	
130 135 140	
aag tac tac ggg cgc ggc ccg ctg cag atc tgc tgg aac tac aac tac	480
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr	
145 150 155 160	
ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc ggc	528
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly	
165 170 175	
agg gtg gcg ccg gac gct gtg gtg gcg ttc aag gcg gcg ctc tgg ttc	576
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe	
180 185 190	
tgg atg aac agc gtg cac ggg gtg gcg ccg cag ggg ttc ggc gcc acc	624
Trp Met Asn Ser Val His Gly Val Ala Pro Gln Gly Phe Gly Ala Thr	
195 200 205	
atc agg gcc atc aac ggc gca ctc gag tgc ggc ggg aac aac ccc gcc	672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala	
210 215 220	
cag atg aac gcg cgc gtc ggc tac tac aag cag tac tgc cac cag ctc	720
Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys His Gln Leu	
225 230 235 240	
ggc gtc gac cca ggg ccc aac ctc act tgc tga	753
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys *	

<210> 50
 <211> 250
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 50

Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe
1				5				10						15	
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser
		20					25					30			
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Val
	35					40					45				
Asn	Val	Ala	Ser	Ile	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Asn
50					55				60						
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala
65				70				75						80	
Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Thr
			85				90					95			
Glu	Val	Glu	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Val	Thr
	100						105					110			
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Ser	Lys	Ser	Asn
	115					120					125				
Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln
	130					135				140					
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr
145				150				155						160	
Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly
			165				170						175		
Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe
	180						185					190			
Trp	Met	Asn	Ser	Val	His	Gly	Val	Ala	Pro	Gln	Gly	Phe	Gly	Ala	Thr
	195					200					205				
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Gly	Gly	Asn	Asn	Pro	Ala
	210				215					220					
Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Lys	Gln	Tyr	Cys	His	Gln	Leu
225				230				235						240	
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys						
			245				250								

<210> 51
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(753)

<400> 51

tcg	atg	cag	aac	tgc	ggc	tgc	cag	cca	aac	gta	tgc	tgc	agc	aag	ttt	48
Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe	
1				5				10						15		
ggc	tac	tgc	ggc	acg	acc	gac	gag	tac	tgc	ggc	gac	ggg	tgc	cag	tcg	96

Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser		
			20					25					30				
ggc	ccg	tgc	cgc	tcg	ggc	ggc	ggc	ggc	agc	agt	ggc	ggc	ggg	ggg	gcg	144	
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Ala		
		35					40					45					
aac	gtg	gct	agc	gtc	gtc	acc	ggc	tcc	ttc	ttc	aac	ggc	atc	aag	agc	192	
Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Ser		
	50					55					60						
cag	gcc	ggg	agc	ggg	tgc	gag	ggc	aag	aac	ttc	tac	acc	cgg	agc	gcg	240	
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala		
65					70				75						80		
ttc	ctg	agc	gcc	gtc	aag	gcg	tac	cca	ggc	ttc	gcc	cat	ggc	ggg	tcg	288	
Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Ser		
				85				90					95				
cag	gtg	cag	ggc	aag	cgc	gag	atc	gcc	gcc	ttc	ttc	gcg	cat	gtc	acg	336	
Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Val	Thr		
		100						105				110					
cac	gag	acc	ggg	cat	ttc	tgc	tac	atc	agc	gag	atc	aac	aag	agc	aac	384	
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Asn	Lys	Ser	Asn		
		115					120					125					
gcc	tac	tgc	gac	ccg	acc	aag	agg	cag	tgg	ccg	tgc	gcc	gcg	ggg	cag	432	
Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln		
	130					135					140						
aag	tac	tac	ggg	cgc	ggc	ccg	ctg	cag	atc	tcg	tgg	aac	tac	aac	tac	480	
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr		
145					150				155						160		
ggg	ccc	gcg	ggg	agg	gcc	atc	ggc	ttc	gac	ggg	ctc	ggg	gac	ccc	ggc	528	
Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly		
				165				170						175			
agg	gtg	gcg	cgg	gac	gcc	gtg	gtg	gcg	ttc	aag	gcg	gcg	ctc	tgg	ttc	576	
Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe		
			180					185					190				
tgg	atg	aac	aac	gtg	cac	cgt	gtg	atg	ccg	cag	ggc	ttc	ggc	gcc	acc	624	
Trp	Met	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr			
		195				200						205					
atc	agg	gcc	atc	aac	ggc	gcc	ctc	gag	tgc	ggc	ggg	aac	aac	ccc	gcc	672	
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Gly	Gly	Asn	Asn	Pro	Ala		
	210					215					220						
cag	atg	aac	gcg	cgc	gtc	ggc	tac	tac	agg	cag	tac	tgc	cgc	cag	ctc	720	
Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Arg	Gln	Tyr	Cys	Arg	Gln	Leu		
225					230				235						240		
ggc	gtc	gac	cca	ggg	ccc	aac	ctc	act	tgc	tga						753	
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	*							
				245					250								

<210> 52
 <211> 250
 <212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 52

Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe
1				5					10					15	
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser
			20					25					30		
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Ala
		35					40					45			
Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Ser
	50					55					60				
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala
65					70					75				80	
Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Ser
				85					90					95	
Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Val	Thr
			100					105					110		
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Asn	Lys	Ser	Asn
			115					120					125		
Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln
	130					135					140				
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr
145					150					155				160	
Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly
				165					170					175	
Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe
			180					185					190		
Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr
		195					200						205		
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Gly	Gly	Asn	Asn	Pro	Ala
	210					215					220				
Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Arg	Gln	Tyr	Cys	Arg	Gln	Leu
225					230					235					240
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys						
				245					250						

<210> 53

<211> 753

<212> DNA

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(753)

<400> 53

tcg	atg	cag	aac	tgc	ggc	tgc	cag	cca	aac	gta	tgc	tgc	agc	aag	ttt	48
Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe	
1				5					10					15		
ggc	tac	tgc	ggc	acg	acc	gac	gag	tac	tgc	ggc	gcc	ggg	tgc	cag	tcg	96
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Ala	Gly	Cys	Gln	Ser	
			20					25					30			
ggc	ccg	tgc	cac	tcg	ggc	ggc	ggc	ggc	agc	agt	ggc	ggc	ggt	ggt	gcg	144
Gly	Pro	Cys	His	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Ala	

35	40	45	
aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag aac			192
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn			
50	55	60	
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg			240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala			
65	70	75	80
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg tcg			288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser			
85	90	95	
cag gtg cag ggc aag cgc gag atc gcc gcc ttc ttc gcg cat gtc acg			336
Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr			
100	105	110	
cat gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac			384
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn			
115	120	125	
gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag			432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln			
130	135	140	
aag tac tac ggg cgc ggc ccg ctg cag ctg tcg tgg aac tac aac tac			480
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Leu Ser Trp Asn Tyr Asn Tyr			
145	150	155	160
ggg ccc gcc ggg agg gac atc ggc ttc aac ggg ctc gcc gac ccc aac			528
Gly Pro Ala Gly Arg Asp Ile Gly Phe Asn Gly Leu Ala Asp Pro Asn			
165	170	175	
agg gtg gcg cag gac gcc gtg atc gcg ttc aag tcg gcg ctc tgg ttc			576
Arg Val Ala Gln Asp Ala Val Ile Ala Phe Lys Ser Ala Leu Trp Phe			
180	185	190	
tgg atg aac aac gtg cac cgt gtg atg ccg cag ggc ttc ggc gcc acc			624
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr			
195	200	205	
atc agg gcc atc aac ggc gcc ctc gag tgc ggc ggg aac aac ccc gcc			672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala			
210	215	220	
cag atg aac gcg cgc gtc ggc tac tac agg cag tac tgc cgc cag ctc			720
Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln Leu			
225	230	235	240
ggc gtc gac cca ggg ccc aac ctc act tgc tga			753
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys *			
245	250		

<210> 54
 <211> 250
 <212> PRT
 <213> Artificial Sequence
 <220>

<223> Variant sequence produced by shuffling techniques

<400> 54

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Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1          5          10          15
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser
          20          25          30
Gly Pro Cys His Ser Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala
          35          40          45
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn
          50          55          60
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
65          70          75          80
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
          85          90          95
Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr
          100          105          110
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
          115          120          125
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
          130          135          140
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Leu Ser Trp Asn Tyr Asn Tyr
145          150          155          160
Gly Pro Ala Gly Arg Asp Ile Gly Phe Asn Gly Leu Ala Asp Pro Asn
          165          170          175
Arg Val Ala Gln Asp Ala Val Ile Ala Phe Lys Ser Ala Leu Trp Phe
          180          185          190
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr
          195          200          205
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala
          210          215          220
Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg Gln Tyr Cys Arg Gln Leu
225          230          235          240
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys
          245          250

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<210> 55

<211> 753

<212> DNA

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(753)

<400> 55

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tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt      48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1          5          10          15

ggc tac tgc ggc aca acc gac gag tac tgc ggc gac ggg tgc cag tcg      96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
          20          25          30

ggc ccg tgc cac tcg ggc ggc ggt ggc ggc ggt ggc ggc ggt ggt gcg      144
Gly Pro Cys His Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Ala
          35          40          45

aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag aac      192
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn

```

50	55	60	
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg			240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala			
65	70	75	80
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg tca			288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser			
	85	90	95
cag gtg cag ggc aag cgc gag atc gcc gcc ttc ttc gcg cat gtc acg			336
Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr			
	100	105	110
cac gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac			384
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn			
	115	120	125
gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag			432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln			
	130	135	140
aag tac tac ggg cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac			480
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr			
	145	150	155
ggg ccc gcg ggg agg gac atc ggc ttc aac ggg ctc gcc gac ccc aac			528
Gly Pro Ala Gly Arg Asp Ile Gly Phe Asn Gly Leu Ala Asp Pro Asn			
	165	170	175
agg gtg gcg cag gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg ttc			576
Arg Val Ala Gln Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe			
	180	185	190
tgg atg aac aac gtg cac cgt gtg atg ccg cag ggc ttc ggc gcc acc			624
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr			
	195	200	205
atc agg gcc atc aac ggc gcc ctc gag tgc ggc ggg aac aac ccc gcc			672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala			
	210	215	220
cag atg aac gcg cgc atc ggc tac tac aag cag tac tgc cgc cag ctc			720
Gln Met Asn Ala Arg Ile Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu			
	225	230	235
ggc gtc gac cca ggg ccc aac ctc act tgc tga			753
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys *			
	245	250	

<210> 56

<211> 250

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 56

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe			
1	5	10	15
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser			

			20					25					30				
Gly	Pro	Cys	His	Ser	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Ala		
		35					40					45					
Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Asn		
	50					55					60						
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala		
65					70					75					80		
Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Ser		
				85					90					95			
Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Val	Thr		
			100					105					110				
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Asn	Lys	Ser	Asn		
		115					120					125					
Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln		
	130					135					140						
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr		
145					150					155				160			
Gly	Pro	Ala	Gly	Arg	Asp	Ile	Gly	Phe	Asn	Gly	Leu	Ala	Asp	Pro	Asn		
				165					170					175			
Arg	Val	Ala	Gln	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe		
			180					185					190				
Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr		
		195					200					205					
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Gly	Gly	Asn	Asn	Pro	Ala		
	210				215					220							
Gln	Met	Asn	Ala	Arg	Ile	Gly	Tyr	Tyr	Lys	Gln	Tyr	Cys	Arg	Gln	Leu		
225					230					235					240		
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys								
				245					250								

<210> 57
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

 <221> CDS
 <222> (1)...(753)

<400> 57																
tcg	atg	cag	aat	tgc	ggc	tgc	cag	cca	aac	gta	tgc	tgc	agc	aag	ttc	48
Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe	
1				5				10					15			
ggc tac tgc ggc acg acc gac gag tac tgc ggc gcc ggg tgc cag tcg																96
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Ala	Gly	Cys	Gln	Ser	
			20				25						30			
ggc ccg tgc cgc tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg																144
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Ala	
		35					40					45				
aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag aac																192
Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Asn	
	50					55					60					
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg																240
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala	
65					70					75					80	

ttc ctg agc gcc gtc aac gcg tac ccg ggc ttc gcc cat ggc ggg acg	288
Phe Leu Ser Ala Val Asn Ala Tyr Pro Gly Phe Ala His Gly Gly Thr	
85 90 95	
gag gtg gag cgc aag cgc gag att gcc gcc ttc ttc gcg cac gcc acg	336
Glu Val Glu Arg Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr	
100 105 110	
cac gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac	384
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn	
115 120 125	
gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag	432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln	
130 135 140	
aag tac tac ggg cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac	480
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr	
145 150 155 160	
ggg ccc gcg ggg ggg gcc atc ggc ttc gac ggg ctc ggg gac ccc ggc	528
Gly Pro Ala Gly Gly Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly	
165 170 175	
agg gtg gcg cgg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg ttc	576
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe	
180 185 190	
tgg atg aac aac gtg cac cgt gtg atg ccg cag ggc ttc ggc gcc acc	624
Trp Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr	
195 200 205	
atc cgg gcc atc aac ggc gcc ctc gag tgc gac ggc aag aac ccc aac	672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Asp Gly Lys Asn Pro Asn	
210 215 220	
tcc gtc aac aac cgc gtc gcc tac tac agg cag tac tgc cgc cag ctc	720
Ser Val Asn Asn Arg Val Ala Tyr Tyr Arg Gln Tyr Cys Arg Gln Leu	
225 230 235 240	
ggc gtc gac cca ggg ccc aac ctc act tgc tga	753
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys *	
245 250	

<210> 58

<211> 250

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 58

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser	
20 25 30	
Gly Pro Cys Arg Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Ala	
35 40 45	
Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn	
50 55 60	
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala	

65					70					75					80
Phe	Leu	Ser	Ala	Val	Asn	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Thr
				85					90					95	
Glu	Val	Glu	Arg	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Ala	Thr
			100					105					110		
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Asn	Lys	Ser	Asn
		115					120					125			
Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln
	130					135					140				
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr
145					150					155				160	
Gly	Pro	Ala	Gly	Gly	Ala	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly
			165					170					175		
Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe
			180					185					190		
Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr
	195						200					205			
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asp	Gly	Lys	Asn	Pro	Asn
	210				215					220					
Ser	Val	Asn	Asn	Arg	Val	Ala	Tyr	Tyr	Arg	Gln	Tyr	Cys	Arg	Gln	Leu
225				230					235					240	
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys						
				245				250							

<210> 59

<211> 771

<212> DNA

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(771)

<400> 59

tcg atg cag aac tgc ggc tgc cag cca aac ttc tgc tgc agc aag ttt	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gcc tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tcg ggc ggc ggt ggc ggc ggt ggc ggc gga ggc ggc	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg ttc	192
Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe	
50 55 60	
ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag aac	240
Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn	
65 70 75 80	
ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc	288
Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly	
85 90 95	
ttc gcc cat ggc ggg tca cag gtg cag ggc aag cgc gag att gcc gcc	336
Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala	

100	105	110	
ttc ttc gcg cat gtc acg cac gag acc ggg cat ttc tgc tac atc agc			384
Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser			
115	120	125	
gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg			432
Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp			
130	135	140	
ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag atc			480
Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile			
145	150	155	160
tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc gac			528
Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp			
	165	170	175
ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg ttc			576
Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe			
	180	185	190
aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg ccg			624
Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro			
	195	200	205
cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag tgc			672
Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys			
210	215	220	
gac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac agg			720
Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Arg			
225	230	235	240
cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act tgc			768
Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys			
	245	250	255
tga			771
*			

<210> 60
 <211> 256
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 60
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Ala Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45
 Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala Phe
 50 55 60
 Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn
 65 70 75 80
 Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly

				85					90					95			
Phe	Ala	His	Gly	Gly	Ser	Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala		
			100					105					110				
Phe	Phe	Ala	His	Val	Thr	His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser		
		115					120					125					
Glu	Ile	Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp		
	130					135				140							
Pro	Cys	Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile		
145					150					155					160		
Ser	Trp	Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp		
				165					170					175			
Gly	Leu	Gly	Asp	Pro	Gly	Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe		
			180					185					190				
Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro		
		195					200					205					
Gln	Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys		
	210					215					220						
Asp	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Arg		
225						230				235					240		
Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys		
				245					250					255			

<210> 61

<211> 771

<212> DNA

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(771)

<400> 61

tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc ccg ggc ggc ggc ggc ggt ggc ggc ggc gga ggc ggc	144
Gly Pro Cys Arg Pro Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
gga ggc agt ggc ggt gcg aac gtg gct agc gtc gtc acc ggc tcc ttc	192
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe	
50 55 60	
ttc aac ggc atc aag agc cag gcc ggg agc ggg tgc gag ggc aag aac	240
Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn	
65 70 75 80	
ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc	288
Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly	
85 90 95	
ttc gcc cat ggc ggc tcc gag gtc gag cgc aag cgc gag att gcc gcc	336
Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala Ala	
100 105 110	

ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc aac	384
Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile Asn	
115 120 125	
gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg	432
Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp	
130 135 140	
ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag atc	480
Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile	
145 150 155 160	
tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc gac	528
Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp	
165 170 175	
ggg ctc gcc gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg ttc	576
Gly Leu Ala Ala Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe	
180 185 190	
aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg ccg	624
Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro	
195 200 205	
cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcg ctc gag tgc	672
Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys	
210 215 220	
gac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac aag	720
Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr Lys	
225 230 235 240	
cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act tgc	768
Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys	
245 250 255	
tga	771
*	

<210> 62
 <211> 256
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 62
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Pro Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45
 Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe
 50 55 60
 Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn
 65 70 75 80
 Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly
 85 90 95
 Phe Ala His Gly Gly Ser Glu Val Glu Arg Lys Arg Glu Ile Ala Ala

			100					105					110				
Phe	Phe	Ala	His	Ala	Thr	His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Asn		
		115					120					125					
Glu	Ile	Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp		
	130					135				140							
Pro	Cys	Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile		
145				150					155					160			
Ser	Trp	Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp		
			165						170					175			
Gly	Leu	Ala	Asp	Pro	Gly	Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe		
		180						185					190				
Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro		
	195						200			205							
Gln	Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys		
	210				215				220								
Asp	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Lys		
225				230					235					240			
Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys		
			245					250						255			

<210> 63
 <211> 774
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(774)

<400> 63	
tcg atg cag aac tgc ggc tgc cag cca aac ttc tgc tgc agc aag ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc aca acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tcg ggc ggc ggc ggc ggc ggc ggc ggc ggc gga ggc	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg	192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala	
50 55 60	
ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag	240
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys	
65 70 75 80	
aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca	288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro	
85 90 95	
ggc ttc gcc cat ggc ggg tca cag gtg cag ggc aag cgc gag atc gcc	336
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala	
100 105 110	
gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc	384
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile	

115	120	125	
agc gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag			432
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln			
130	135	140	
tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag			480
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln			
145	150	155	160
ctg tgc tgg aac tac aac tac ggg ccc gcc ggg agg gac atc ggc ttc			528
Leu Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Asp Ile Gly Phe			
165	170	175	
aac ggg ctc gcc gac ccc aac agg gtg gcg cgg gac ccc gtg ctg gcg			576
Asn Gly Leu Ala Asp Pro Asn Arg Val Ala Arg Asp Pro Val Leu Ala			
180	185	190	
ttc aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg			624
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met			
195	200	205	
ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc aag			672
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Lys			
210	215	220	
tgc ggc ggg aac aac ccc gcc cag atg gac gcg cgc gtc ggc tac tac			720
Cys Gly Gly Asn Asn Pro Ala Gln Met Asp Ala Arg Val Gly Tyr Tyr			
225	230	235	240
aag cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act			768
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr			
245	250	255	
tgc tga			774
Cys *			

<210> 64
 <211> 257
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 64
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Phe Cys Cys Ser Lys Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45
 Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala
 50 55 60
 Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
 65 70 75 80
 Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro

85 90 95
 Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala

			100					105					110				
Ala	Phe	Phe	Ala	His	Ala	Thr	His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile		
		115						120				125					
Ser	Glu	Ile	Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln		
	130					135				140							
Trp	Pro	Cys	Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln		
145					150					155					160		
Leu	Ser	Trp	Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Asp	Ile	Gly	Phe		
			165					170					175				
Asn	Gly	Leu	Ala	Asp	Pro	Asn	Arg	Val	Ala	Arg	Asp	Pro	Val	Leu	Ala		
		180						185					190				
Phe	Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met		
	195						200					205					
Pro	Gln	Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Lys		
	210					215				220							
Cys	Gly	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asp	Ala	Arg	Val	Gly	Tyr	Tyr		
225				230					235						240		
Lys	Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr		
			245					250						255			

Cys

<210> 65
 <211> 774
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques
 <221> CDS
 <222> (1)...(774)

<400> 65																	
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt																	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe																	
1 5 10 15																	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg																	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser																	
20 25 30																	
ggc ccg tgc cgc ccg ggt ggc ggt ggc ggc ggc ggc ggc ggc gga ggc																	144
Gly Pro Cys Arg Pro Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly																	
35 40 45																	
ggc gga ggc agt ggt ggt gcg aac gtg gct agc gtc gtc acc gac tcc																	192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Asp Ser																	
50 55 60																	
ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag																	240
Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys																	
65 70 75 80																	
aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca																	288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro																	
85 90 95																	
ggc ttc gcc cat ggc ggg tcg cag gtg cag ggc aag cgc gag atc gcc																	336
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala																	
100 105 110																	

gcc ttc ttc gcg cat gtc acg cac gag acc ggg cat ttc tgc tac atc	384
Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile	
115 120 125	
agc gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag	432
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln	
130 135 140	
tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgt ggc ccg ctg cag	480
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln	
145 150 155 160	
atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc	528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe	
165 170 175	
gac ggg ctc gcc gac ccc aac agg gtg gcg cag gac gcc gtg gtg gcg	576
Asp Gly Leu Ala Asp Pro Asn Arg Val Ala Gln Asp Ala Val Val Ala	
180 185 190	
ttc aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg	624
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met	
195 200 205	
ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag	672
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu	
210 215 220	
tgc ggc ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc tac tac	720
Cys Gly Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly Tyr Tyr	
225 230 235 240	
aag cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act	768
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr	
245 250 255	
tgc tga	774
Cys *	

<210> 66
 <211> 257
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 66
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Pro Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45
 Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Asp Ser
 50 55 60
 Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys
 65 70 75 80

Asn	Phe	Tyr	Thr	Arg	Ser	Ala	Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	
			85						90					95		
Gly	Phe	Ala	His	Gly	Gly	Ser	Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	
			100					105					110			
Ala	Phe	Phe	Ala	His	Val	Thr	His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	
			115				120					125				
Ser	Glu	Ile	Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	
	130					135					140					
Trp	Pro	Cys	Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	
145					150					155					160	
Ile	Ser	Trp	Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	
			165					170						175		
Asp	Gly	Leu	Ala	Asp	Pro	Asn	Arg	Val	Ala	Gln	Asp	Ala	Val	Val	Ala	
			180					185					190			
Phe	Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	
		195				200					205					
Pro	Gln	Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	
	210					215					220					
Cys	Gly	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	
225				230					235						240	
Lys	Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	
				245					250					255		

Cys

<210> 67
 <211> 765
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques
 <221> CDS
 <222> (1)...(765)

<400> 67	
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc aca acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tcg ggc ggc ggc ggc ggc ggc gga ggc ggc gga ggc	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
agt ggt ggt gcg aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac	192
Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe Phe Asn	
50 55 60	
ggc atc aag aac cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac	240
Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr	
65 70 75 80	
acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc	288
Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala	
85 90 95	
cat ggc ggg tca cag gtg cag ggc aag cgc gag att gcc gcc ttc ttc	336

His	Gly	Gly	Ser	Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe		
			100					105						110			
gcg	cac	gcc	acg	cac	gag	acc	ggg	cat	ttc	tgc	tac	atc	agc	gag	atc	384	
Ala	His	Ala	Thr	His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile		
		115					120					125					
aac	aag	agc	aac	gcc	tac	tgc	gac	ccg	acc	aag	agg	cag	tgg	ccg	tgc	432	
Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys		
	130					135					140						
gcc	gcg	ggg	cag	aag	tac	tac	ggg	cgc	ggc	ccg	ctg	cag	atc	tcg	tgg	480	
Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp		
145					150				155						160		
aac	tac	aac	tac	ggg	ccc	gcg	ggg	agg	gcc	atc	ggc	ttc	gac	ggg	ctc	528	
Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu		
				165				170						175			
ggg	gac	ccc	aac	agg	gtg	gcg	cag	gac	gcc	gtg	gtg	gcg	ttc	aag	gcg	576	
Gly	Asp	Pro	Asn	Arg	Val	Ala	Gln	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala		
			180					185					190				
gcg	ctc	tgg	ttc	tgg	atg	aac	aac	gtg	cac	cgt	gtg	atg	ccg	cag	ggc	624	
Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly		
		195					200					205					
ttc	ggc	gcc	acc	atc	agg	gcc	atc	aac	ggc	gcg	ctc	gag	tgc	gac	ggg	672	
Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asp	Gly		
	210					215					220						
aac	aac	ccc	gcc	cag	atg	aac	gcg	cgc	gtc	ggc	tac	tac	aag	cag	tac	720	
Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Lys	Gln	Tyr		
225					230				235						240		
tgc	cgc	cag	ctc	ggc	gtc	gac	cca	ggg	ccc	aac	ctc	act	tgc	tga		765	
Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	*			
			245					250									

<210> 68

<211> 254

<212> PRT

<213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<400> 68

Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe		
1			5					10					15				
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser		
		20					25					30					
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly		
	35				40				45								
Ser	Gly	Gly	Ala	Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn		
	50				55				60								
Gly	Ile	Lys	Asn	Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr		
65				70				75					80				
Thr	Arg	Ser	Ala	Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala		
			85					90					95				
His	Gly	Gly	Ser	Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe		

		100						105					110				
Ala	His	Ala	Thr	His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile		
		115						120					125				
Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys		
		130						135					140				
Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp		
145					150					155					160		
Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu		
				165					170						175		
Gly	Asp	Pro	Asn	Arg	Val	Ala	Gln	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala		
			180					185					190				
Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly		
		195						200					205				
Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asp	Gly		
210						215					220						
Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Lys	Gln	Tyr		
225					230					235					240		
Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys				
			245						250								

<210> 69
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(753)

<400> 69																
tcg	atg	cag	aac	tgc	ggc	tgc	cag	cca	aac	gta	tgc	tgc	agc	aag	ttc	48
Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe	
1				5					10					15		
ggc tac tgc ggc aca acc gac gag tac tgc ggc gac ggg tgc cag tcg																96
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser	
			20					25					30			
ggc ccg tgc cgc tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg																144
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Ala	
		35					40					45				
aac gtg gct agc gtc gtc acc ggc tcc ttc ttc aac ggc atc aag aac																192
Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Asn	
		50				55					60					
cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg																240
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala	
		65			70				75						80	
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg tca																288
Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Ser	
				85				90						95		
cag gtg cag ggc aag cgc gag atc gcc gcc ttc ttc gcg cac gcc acg																336
Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Ala	Thr	
			100					105					110			
cac gag acc ggg cat ttc tgt tac atc agc gag atc agc aag agc aac																384
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Ser	Lys	Ser	Asn	

115					120					125							
gcc	tac	tgc	gac	ccg	acc	aag	agg	cag	tgg	ccg	tgc	gcc	gcg	ggg	cag	432	
Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln		
130					135					140							
aag	tac	tac	ggg	cgc	ggc	ccg	ctg	cag	atc	tcg	tgg	aac	tac	aac	tac	480	
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr		
145					150					155					160		
ggg	ccc	gcg	ggg	agg	gac	atc	ggc	ttc	gac	ggg	ctc	ggg	gac	ccc	ggc	528	
Gly	Pro	Ala	Gly	Arg	Asp	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly		
165					170					175							
agg	gtg	gcg	cgg	gac	gcc	gtg	gtg	gcg	ttc	aag	gcg	gcg	ctc	tgg	ttc	576	
Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe		
180					185					190							
tgg	atg	aac	aac	gtg	cac	cgt	gtg	atg	ccg	cag	ggc	ttc	ggc	gcc	acc	624	
Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr		
195					200					205							
atc	agg	gcc	atc	aac	ggc	gcg	ctc	gag	tgc	gac	ggg	aac	aac	ccc	gcc	672	
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asp	Gly	Asn	Asn	Pro	Ala		
210					215					220							
cag	atg	aac	gcg	cgc	atc	ggc	tac	tac	aag	cag	tac	tgc	cgc	cag	ctc	720	
Gln	Met	Asn	Ala	Arg	Ile	Gly	Tyr	Tyr	Lys	Gln	Tyr	Cys	Arg	Gln	Leu		
225					230					235					240		
ggc	gtc	gac	cca	ggg	ccc	aac	ctc	act	tgc	tga						753	
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	*							
245					250												

<210> 70
 <211> 250
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 70

Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe
1				5					10					15	
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser
		20						25					30		
Gly	Pro	Cys	Arg	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Ala
		35				40						45			
Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	Phe	Asn	Gly	Ile	Lys	Asn
	50					55					60				
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala
65					70					75					80
Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Ser
			85						90					95	
Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Ala	Thr
			100					105					110		
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Ser	Lys	Ser	Asn
		115				120						125			
Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln
		130				135						140			
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr

145		150		155		160									
Gly	Pro	Ala	Gly	Arg	Asp	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly
				165					170					175	
Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe
				180					185					190	
Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr
		195					200					205			
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asp	Gly	Asn	Asn	Pro	Ala
	210					215					220				
Gln	Met	Asn	Ala	Arg	Ile	Gly	Tyr	Tyr	Lys	Gln	Tyr	Cys	Arg	Gln	Leu
225					230					235					240
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys						
				245					250						

<210> 71
 <211> 774
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(774)

<400> 71	
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc tcg ggc ggc ggt ggc ggc ggc ggc ggc ggc gga ggc	144
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
ggc gga ggc agt ggc ggt gcg aac gtg gct aat gtg gtc acc gac gcg	192
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala	
50 55 60	
ttc ttc aac ggc atc aag agc cag gcc ggg agc ggg tgc gag ggc aag	240
Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys	
65 70 75 80	
aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca	288
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro	
85 90 95	
ggc ttc gcc cat ggc ggg tca cag gtg cag ggc aag cgc gag atc gcc	336
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala	
100 105 110	
gcc ttc ttc gcg cac gcc acg cac gag acc ggg cat ttc tgc tac atc	384
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile	
115 120 125	
agc gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag	432
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln	
130 135 140	

tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg ctg cag	480
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln	
145 150 155 160	
atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc	528
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe	
165 170 175	
gac ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg	576
Asp Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala	
180 185 190	
ttc aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg	624
Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met	
195 200 205	
ccg cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcg ctc gag	672
Pro Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu	
210 215 220	
tgc gac ggg aac aac ccc gcc cag atg aac gcg cgc atc ggc tac tac	720
Cys Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Ile Gly Tyr Tyr	
225 230 235 240	
aag cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act	768
Lys Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr	
245 250 255	
tgc tga	774
Cys *	

<210> 72
 <211> 257
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 72

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
Gly Pro Cys Arg Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
Gly Gly Gly Ser Gly Gly Ala Asn Val Ala Asn Val Val Thr Asp Ala	
50 55 60	
Phe Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys	
65 70 75 80	
Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro	
85 90 95	
Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala	
100 105 110	
Ala Phe Phe Ala His Ala Thr His Glu Thr Gly His Phe Cys Tyr Ile	
115 120 125	
Ser Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln	
130 135 140	
Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln	
145 150 155 160	
Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe	

				165					170					175			
Asp	Gly	Leu	Gly	Asp	Pro	Gly	Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala		
			180					185					190				
Phe	Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met		
		195					200					205					
Pro	Gln	Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu		
	210					215					220						
Cys	Asp	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Ile	Gly	Tyr	Tyr		
225					230					235					240		
Lys	Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr		
			245						250					255			

Cys

<210> 73
 <211> 771
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(771)

<400> 73																	
tgc atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc																	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe																	
1 5 10 15																	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tgc																	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser																	
20 25 30																	
ggc ccg tgc cgc ccg ggc ggc ggc ggc ggt ggc ggc ggc gga ggc ggc																	144
Gly Pro Cys Arg Pro Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly																	
35 40 45																	
gga ggc agt ggc ggt gcg aac gtg gct agc gtc gtc acc gac tcc ttc																	192
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Asp Ser Phe																	
50 55 60																	
ttc aac ggc atc aag agc cag gcc ggc agc ggc tgc gag ggc aag aac																	240
Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn																	
65 70 75 80																	
ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc																	288
Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly																	
85 90 95																	
ttc gcc cat ggc ggc tgc cag gtg cag ggc aag cgc gag atc gcc gcc																	336
Phe Ala His Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala																	
100 105 110																	
ttc ttc gcg cat gtc acg cac gag acc ggc cat ttc tgc tac atc aac																	384
Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Asn																	
115 120 125																	
gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg																	432
Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp																	
130 135 140																	

ccg tgc gcc gcg ggg cag agg tac tac ggg cgt ggc ccg ctg cag atc	480
Pro Cys Ala Ala Gly Gln Arg Tyr Tyr Gly Arg Gly Pro Leu Gln Ile	
145 150 155 160	
tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttc gac	528
Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp	
165 170 175	
ggg ctc ggg gac ccc ggc agg gtg gcg cgg gac gcc gtg gtg gcg ttc	576
Gly Leu Gly Asp Pro Gly Arg Val Ala Arg Asp Ala Val Val Ala Phe	
180 185 190	
aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg ccg	624
Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro	
195 200 205	
cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag tgc	672
Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys	
210 215 220	
gac ggg aac aac ccc gcc cag atg aac gcg cgc atc ggc tac tac aag	720
Asp Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Ile Gly Tyr Tyr Lys	
225 230 235 240	
cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac ctc act tgc	768
Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn Leu Thr Cys	
245 250 255	
tga	771
*	

<210> 74
 <211> 256
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 74
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Pro Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45
 Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Asp Ser Phe
 50 55 60
 Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn
 65 70 75 80
 Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly
 85 90 95
 Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala
 100 105 110
 Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Asn
 115 120 125
 Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp
 130 135 140
 Pro Cys Ala Ala Gly Gln Arg Tyr Tyr Gly Arg Gly Pro Leu Gln Ile
 145 150 155 160
 Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp

				165					170					175			
Gly	Leu	Gly	Asp	Pro	Gly	Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe		
			180					185						190			
Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro		
		195					200					205					
Gln	Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys		
	210					215					220						
Asp	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Ile	Gly	Tyr	Tyr	Lys		
225						230				235					240		
Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys		
				245					250					255			

<210> 75
 <211> 780
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(780)

<400> 75																	
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt																	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe																	
1 5 10 15																	
ggc tac tgc ggc aca acc gac gag tac tgc ggc gac ggg tgc cag tcg																	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser																	
20 25 30																	
ggc ccg tgc cgc ccg ggt ggc ggt ggc ggc ggc ggc ggc ggc gga ggc																	144
Gly Pro Cys Arg Pro Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly																	
35 40 45																	
ggc gga ggc agt ggc ggc ggt ggt gtg aac gtg gcc agc atc gtg acc																	192
Gly Gly Gly Ser Gly Gly Gly Gly Val Asn Val Ala Ser Ile Val Thr																	
50 55 60																	
ggc tcc ttc ttc aac ggc atc aag aac cag gcc ggg agc ggg tgc gag																	240
Gly Ser Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu																	
65 70 75 80																	
ggc aag aac ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg																	288
Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala																	
85 90 95																	
tac cca ggc ttc gcc cat ggc ggc tca cag gtg cag ggc aag cgc gag																	336
Tyr Pro Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu																	
100 105 110																	
atc gcc gcc ttc ttc gcg cat gtc acg cat gag acc ggg cat ttc tgc																	384
Ile Ala Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys																	
115 120 125																	
tac atc agc gag atc agc aag agc aac gcc tac tgc gac ccg acc aag																	432
Tyr Ile Ser Glu Ile Ser Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys																	
130 135 140																	
agg cag tgg ccg tgc gcc gcg ggg cag aag tac tac ggg cgc ggc ccg																	480
Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro																	

145		150		155		160	
ctg cag atc tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc	528						
Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile							
		165		170		175	
ggc ttc gac ggg ctc ggg gac ccc aac agg gtg gcg cgg gac ccc gtg	576						
Gly Phe Asp Gly Leu Gly Asp Pro Asn Arg Val Ala Arg Asp Pro Val							
		180		185		190	
ctg gcg ttc aag gcg gcg ctc tgg ttc tgg atg aac agc gtg cac ggg	624						
Leu Ala Phe Lys Ala Ala Leu Trp Phe Trp Met Asn Ser Val His Gly							
		195		200		205	
gtg gtg ccg cag ggg ttc ggc gcc acc acc agg gcc atc aac ggc gcc	672						
Val Val Pro Gln Gly Phe Gly Ala Thr Thr Arg Ala Ile Asn Gly Ala							
		210		215		220	
ctc gag tgc aac ggg aac aac ccc gcc cag atg aac gcg cgc gtc ggc	720						
Leu Glu Cys Asn Gly Asn Asn Pro Ala Gln Met Asn Ala Arg Val Gly							
		225		230		235	
tac tac agg cag tac tgc cgc cag ctc ggc gtc gac cca ggg ccc aac	768						
Tyr Tyr Arg Gln Tyr Cys Arg Gln Leu Gly Val Asp Pro Gly Pro Asn							
		245		250		255	
ctc act tgc tga	780						
Leu Thr Cys *							

<210> 76
 <211> 259
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 76
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys Arg Pro Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly
 35 40 45
 Gly Gly Gly Ser Gly Gly Gly Gly Val Asn Val Ala Ser Ile Val Thr
 50 55 60
 Gly Ser Phe Phe Asn Gly Ile Lys Asn Gln Ala Gly Ser Gly Cys Glu
 65 70 75 80
 Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala
 85 90 95
 Tyr Pro Gly Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu
 100 105 110
 Ile Ala Ala Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys
 115 120 125
 Tyr Ile Ser Glu Ile Ser Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys
 130 135 140
 Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro
 145 150 155 160
 Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile
 165 170 175
 Gly Phe Asp Gly Leu Gly Asp Pro Asn Arg Val Ala Arg Asp Pro Val

			180					185					190				
Leu	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met	Asn	Ser	Val	His	Gly		
		195					200					205					
Val	Val	Pro	Gln	Gly	Phe	Gly	Ala	Thr	Thr	Arg	Ala	Ile	Asn	Gly	Ala		
		210					215					220					
Leu	Glu	Cys	Asn	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly		
225					230					235					240		
Tyr	Tyr	Arg	Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn		
			245						250					255			
Leu	Thr	Cys															

<210> 77
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques
 <221> CDS
 <222> (1)...(753)

<400> 77	
tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cac tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gtg	144
Gly Pro Cys His Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Val	
35 40 45	
aac gtg gcc agc atc gtg acc ggc tcc ttc ttc aac ggc atc aag aac	192
Asn Val Ala Ser Ile Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn	
50 55 60	
cag gcc ggc agc ggc tgc gag ggc aag aac ttc tac acc cgg agc gcg	240
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala	
65 70 75 80	
ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggc acg	288
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Thr	
85 90 95	
gag gtg gag ggc aag cgc gag att gcc gcc ttc ttc gcg cac gcc acg	336
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr	
100 105 110	
cac gag acc ggc cat ttc tgc tac atc agc gag atc agc aag agc aac	384
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Ser Lys Ser Asn	
115 120 125	
gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggc cag	432
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln	
130 135 140	
aag tac tac gga cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac	480
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr	

145	150	155	160	
ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc aac				528
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Asn	165	170	175	
agg gtg gcg cgg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg ttc				576
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe	180	185	190	
tgg atg aac agc gtg cac cgt gtg atg ccg cag ggc ttc ggc gcc acc				624
Trp Met Asn Ser Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr	195	200	205	
atc agg gcc atc aac ggc gcc ctc gag tgc ggc ggg aac aac ccc gcc				672
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala	210	215	220	
cag atg aac gcg cgc atc ggc tac tac aag cag tac tgc cgc cag ctc				720
Gln Met Asn Ala Arg Ile Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu	225	230	235	240
ggc gtc gac cca ggg ccc aac ctc act tgc tga				753
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys *	245	250		

<210> 78
 <211> 250
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 78

Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe				
1 5 10 15				
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser				
20 25 30				
Gly Pro Cys His Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Val				
35 40 45				
Asn Val Ala Ser Ile Val Thr Gly Ser Phe Phe Asn Gly Ile Lys Asn				
50 55 60				
Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala				
65 70 75 80				
Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Thr				
85 90 95				
Glu Val Glu Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr				
100 105 110				
His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Ser Lys Ser Asn				
115 120 125				
Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln				
130 135 140				
Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr				
145 150 155 160				
Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Asn				
165 170 175				
Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe				
180 185 190				
Trp Met Asn Ser Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr				
195 200 205				
Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys Gly Gly Asn Asn Pro Ala				

210		215		220
Gln Met Asn Ala Arg Ile Gly Tyr Tyr Lys	Gln Tyr Cys Arg Gln Leu			
225	230	235	240	
Gly Val Asp Pro Gly Pro Asn Leu Thr Cys				
245	250			

<210> 79
 <211> 750
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(750)

<400> 79
 tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt 48
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15

ggc tac tgc ggc acg acc gac gag tac tgc ggc gcc ggg tgc cag tcg 96
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser
 20 25 30

ggc ccg tgc cac tcg ggc ggc ggc ggc agc ggc ggc ggt ggt gcg aac 144
 Gly Pro Cys His Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ala Asn
 35 40 45

gtg gct agc gtc gtc acc gac tcc ttc ttc aac ggc atc aag agc cag 192
 Val Ala Ser Val Val Thr Asp Ser Phe Phe Asn Gly Ile Lys Ser Gln
 50 55 60

gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg ttc 240
 Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe
 65 70 75 80

ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg tcg cag 288
 Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser Gln
 85 90 95

gtg cag ggc aag cgc gag atc gcc gcc ttc ttc gcg cat gtc acg cac 336
 Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr His
 100 105 110

gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac gcc 384
 Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala
 115 120 125

tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag aag 432
 Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys
 130 135 140

tac tac ggg cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac ggg 480
 Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly
 145 150 155 160

ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc gcc gac ccc aac agg 528
 Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Ala Asp Pro Asn Arg
 165 170 175

gtg	gcg	cag	gac	gcc	gtg	gtg	gcg	ttc	aag	gcg	gcg	ctc	tgg	ttc	tgg	576
Val	Ala	Gln	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe	Trp	
			180					185					190			
atg	aac	aac	gtg	cac	cgt	gtg	atg	ccg	cag	ggc	ttc	ggc	gcc	acc	atc	624
Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr	Ile	
		195					200					205				
agg	gcc	atc	aac	ggc	gcg	ctc	gag	tgc	gac	ggg	aac	aac	ccc	gcc	cag	672
Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Asp	Gly	Asn	Asn	Pro	Ala	Gln	
	210					215					220					
atg	aac	gcg	cgc	gtc	ggc	tac	tac	aag	cag	tac	tgc	cgc	cag	ctc	ggc	720
Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Lys	Gln	Tyr	Cys	Arg	Gln	Leu	Gly	
225					230					235					240	
gtc	gac	cca	ggg	ccc	aac	ctc	act	tgc	tga							750
Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	*							
				245												

<210> 80
 <211> 249
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 80
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Ala Gly Cys Gln Ser
 20 25 30
 Gly Pro Cys His Ser Gly Gly Gly Ser Gly Gly Gly Ala Asn
 35 40 45
 Val Ala Ser Val Val Thr Asp Ser Phe Phe Asn Gly Ile Lys Ser Gln
 50 55 60
 Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala Phe
 65 70 75 80
 Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser Gln
 85 90 95
 Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Val Thr His
 100 105 110
 Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn Ala
 115 120 125
 Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln Lys
 130 135 140
 Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr Gly
 145 150 155 160
 Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Ala Asp Pro Asn Arg
 165 170 175
 Val Ala Gln Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe Trp
 180 185 190
 Met Asn Asn Val His Arg Val Met Pro Gln Gly Phe Gly Ala Thr Ile
 195 200 205
 Arg Ala Ile Asn Gly Ala Leu Glu Cys Asp Gly Asn Asn Pro Ala Gln
 210 215 220
 Met Asn Ala Arg Val Gly Tyr Tyr Lys Gln Tyr Cys Arg Gln Leu Gly
 225 230 235 240
 Val Asp Pro Gly Pro Asn Leu Thr Cys
 245

<210> 81
 <211> 753
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<221> CDS
 <222> (1)...(753)

<400> 81
 tgc atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttt 48
 Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe
 1 5 10 15

ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tgc 96
 Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser
 20 25 30

ggc ccg tgc cac tcg ggc ggc ggc ggc agc agt ggc ggc ggt ggt gcg 144
 Gly Pro Cys His Ser Gly Gly Gly Gly Ser Ser Gly Gly Gly Gly Ala
 35 40 45

aat gtg gct aat gtg gtc acc gac gcg ttc ttc aac ggc atc aag aac 192
 Asn Val Ala Asn Val Val Thr Asp Ala Phe Phe Asn Gly Ile Lys Asn
 50 55 60

cag gcc ggg agc ggg tgc gag ggc aag aac ttc tac acc cgg agc gcg 240
 Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn Phe Tyr Thr Arg Ser Ala
 65 70 75 80

ttc ctg agc gcc gtc aag gcg tac cca ggc ttc gcc cat ggc ggg tgc 288
 Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly Phe Ala His Gly Gly Ser
 85 90 95

cag gtg cag ggc aag cgc gag att gcc gcc ttc ttc gcg cat gcc acg 336
 Gln Val Gln Gly Lys Arg Glu Ile Ala Ala Phe Phe Ala His Ala Thr
 100 105 110

cac gag acc ggg cat ttc tgc tac atc agc gag atc aac aag agc aac 384
 His Glu Thr Gly His Phe Cys Tyr Ile Ser Glu Ile Asn Lys Ser Asn
 115 120 125

gcc tac tgc gac ccg acc aag agg cag tgg ccg tgc gcc gcg ggg cag 432
 Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp Pro Cys Ala Ala Gly Gln
 130 135 140

aag tac tac ggg cgc ggc ccg ctg cag atc tcg tgg aac tac aac tac 480
 Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile Ser Trp Asn Tyr Asn Tyr
 145 150 155 160

ggg ccc gcg ggg agg gcc atc ggc ttc gac ggg ctc ggg gac ccc ggc 528
 Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp Gly Leu Gly Asp Pro Gly
 165 170 175

agg gtg gcg ccg gac gcc gtg gtg gcg ttc aag gcg gcg ctc tgg ttc 576
 Arg Val Ala Arg Asp Ala Val Val Ala Phe Lys Ala Ala Leu Trp Phe
 180 185 190

tgg atg aac aac gtg cac cgt gtg atg ccg cag ggg ttc ggt gcc acc 624

Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr	
		195					200					205				
atc	cgg	gcc	atc	aac	ggc	gcc	ctc	gag	tgc	ggc	ggg	aac	aac	ccc	gcc	672
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Gly	Gly	Asn	Asn	Pro	Ala	
	210					215					220					
cag	atg	aac	gcg	cgc	atc	ggc	tac	tac	aag	cag	tac	tgc	cgc	cag	ctc	720
Gln	Met	Asn	Ala	Arg	Ile	Gly	Tyr	Tyr	Lys	Gln	Tyr	Cys	Arg	Gln	Leu	
	225				230					235					240	
ggc	gtc	gac	cca	ggg	ccc	aac	ctc	act	tgc	tga						753
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	*						
				245					250							

<210> 82
 <211> 250
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 82

Ser	Met	Gln	Asn	Cys	Gly	Cys	Gln	Pro	Asn	Val	Cys	Cys	Ser	Lys	Phe	
1			5					10					15			
Gly	Tyr	Cys	Gly	Thr	Thr	Asp	Glu	Tyr	Cys	Gly	Asp	Gly	Cys	Gln	Ser	
		20					25					30				
Gly	Pro	Cys	His	Ser	Gly	Gly	Gly	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Ala	
	35					40					45					
Asn	Val	Ala	Asn	Val	Val	Thr	Asp	Ala	Phe	Phe	Asn	Gly	Ile	Lys	Asn	
	50				55				60							
Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	Phe	Tyr	Thr	Arg	Ser	Ala	
65				70					75					80		
Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	Phe	Ala	His	Gly	Gly	Ser	
			85					90					95			
Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala	Phe	Phe	Ala	His	Ala	Thr	
	100						105					110				
His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	Glu	Ile	Asn	Lys	Ser	Asn	
	115					120						125				
Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	Pro	Cys	Ala	Ala	Gly	Gln	
	130				135				140							
Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	Ser	Trp	Asn	Tyr	Asn	Tyr	
145				150					155					160		
Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	Gly	Leu	Gly	Asp	Pro	Gly	
			165				170						175			
Arg	Val	Ala	Arg	Asp	Ala	Val	Val	Ala	Phe	Lys	Ala	Ala	Leu	Trp	Phe	
		180					185					190				
Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	Gln	Gly	Phe	Gly	Ala	Thr	
	195					200						205				
Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	Gly	Gly	Asn	Asn	Pro	Ala	
	210				215						220					
Gln	Met	Asn	Ala	Arg	Ile	Gly	Tyr	Tyr	Lys	Gln	Tyr	Cys	Arg	Gln	Leu	
225				230						235					240	
Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys							
				245					250							

<210> 83
 <211> 771
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Variant sequence produced by shuffling techniques

<221> CDS

<222> (1)...(771)

<400> 83

tcg atg cag aac tgc ggc tgc cag cca aac gta tgc tgc agc aag ttc	48
Ser Met Gln Asn Cys Gly Cys Gln Pro Asn Val Cys Cys Ser Lys Phe	
1 5 10 15	
ggc tac tgc ggc acg acc gac gag tac tgc ggc gac ggg tgc cag tcg	96
Gly Tyr Cys Gly Thr Thr Asp Glu Tyr Cys Gly Asp Gly Cys Gln Ser	
20 25 30	
ggc ccg tgc cgc ccg ggc ggc ggc ggc ggt ggc ggc ggc gga ggc ggc	144
Gly Pro Cys Arg Pro Gly Gly Gly Gly Gly Gly Gly Gly Gly Gly	
35 40 45	
gga ggc agt ggt ggt gcg aac gtg gct agc gtc gtc acc ggc tcc ttc	192
Gly Gly Ser Gly Gly Ala Asn Val Ala Ser Val Val Thr Gly Ser Phe	
50 55 60	
ttc aac ggc atc aag agc cag gcc ggg agc ggg tgc gag ggc aag aac	240
Phe Asn Gly Ile Lys Ser Gln Ala Gly Ser Gly Cys Glu Gly Lys Asn	
65 70 75 80	
ttc tac acc cgg agc gcg ttc ctg agc gcc gtc aag gcg tac cca ggc	288
Phe Tyr Thr Arg Ser Ala Phe Leu Ser Ala Val Lys Ala Tyr Pro Gly	
85 90 95	
ttc gcc cat ggc ggg tcg cag gtg cag ggc aag cgc gag atc gcc gcc	336
Phe Ala His Gly Gly Ser Gln Val Gln Gly Lys Arg Glu Ile Ala Ala	
100 105 110	
ttc ttc gcg cat gtc acg cac gag acc ggg cat ttc tgc tac atc agc	384
Phe Phe Ala His Val Thr His Glu Thr Gly His Phe Cys Tyr Ile Ser	
115 120 125	
gag atc aac aag agc aac gcc tac tgc gac ccg acc aag agg cag tgg	432
Glu Ile Asn Lys Ser Asn Ala Tyr Cys Asp Pro Thr Lys Arg Gln Trp	
130 135 140	
ccg tgc gcc gcg ggg cag aag tac tac ggg cgt ggc ccg ctg cag atc	480
Pro Cys Ala Ala Gly Gln Lys Tyr Tyr Gly Arg Gly Pro Leu Gln Ile	
145 150 155 160	
tcg tgg aac tac aac tac ggg ccc gcg ggg agg gcc atc ggc ttt gac	528
Ser Trp Asn Tyr Asn Tyr Gly Pro Ala Gly Arg Ala Ile Gly Phe Asp	
165 170 175	
ggg ctc gcc gac ccc aac agg gtg gcg cag gac gcc gtg gtg gcg ttc	576
Gly Leu Ala Asp Pro Asn Arg Val Ala Gln Asp Ala Val Val Ala Phe	
180 185 190	
aag gcg gcg ctc tgg ttc tgg atg aac aac gtg cac cgt gtg atg ccg	624
Lys Ala Ala Leu Trp Phe Trp Met Asn Asn Val His Arg Val Met Pro	
195 200 205	
cag ggc ttc ggc gcc acc atc agg gcc atc aac ggc gcc ctc gag tgc	672
Gln Gly Phe Gly Ala Thr Ile Arg Ala Ile Asn Gly Ala Leu Glu Cys	
210 215 220	

ggc	ggg	aac	aac	ccc	gcc	cag	atg	aac	gcg	cgc	gtc	ggc	tac	tac	agg	720
Gly	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Arg	
225					230				235						240	

cag	tac	tgc	cgc	cag	ctc	ggc	gtc	gac	cca	ggg	ccc	aac	ctc	act	tgc	768
Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	
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tga																771
*																

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 <211> 256
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Variant sequence produced by shuffling techniques

<400> 84

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			20					25					30			
Gly	Pro	Cys	Arg	Pro	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	
		35				40						45				
Gly	Gly	Ser	Gly	Gly	Ala	Asn	Val	Ala	Ser	Val	Val	Thr	Gly	Ser	Phe	
	50					55				60						
Phe	Asn	Gly	Ile	Lys	Ser	Gln	Ala	Gly	Ser	Gly	Cys	Glu	Gly	Lys	Asn	
65					70				75					80		
Phe	Tyr	Thr	Arg	Ser	Ala	Phe	Leu	Ser	Ala	Val	Lys	Ala	Tyr	Pro	Gly	
			85						90					95		
Phe	Ala	His	Gly	Ser	Gln	Val	Gln	Gly	Lys	Arg	Glu	Ile	Ala	Ala		
			100				105					110				
Phe	Phe	Ala	His	Val	Thr	His	Glu	Thr	Gly	His	Phe	Cys	Tyr	Ile	Ser	
		115					120					125				
Glu	Ile	Asn	Lys	Ser	Asn	Ala	Tyr	Cys	Asp	Pro	Thr	Lys	Arg	Gln	Trp	
	130					135					140					
Pro	Cys	Ala	Ala	Gly	Gln	Lys	Tyr	Tyr	Gly	Arg	Gly	Pro	Leu	Gln	Ile	
145					150				155					160		
Ser	Trp	Asn	Tyr	Asn	Tyr	Gly	Pro	Ala	Gly	Arg	Ala	Ile	Gly	Phe	Asp	
				165					170					175		
Gly	Leu	Ala	Asp	Pro	Asn	Arg	Val	Ala	Gln	Asp	Ala	Val	Val	Ala	Phe	
			180					185					190			
Lys	Ala	Ala	Leu	Trp	Phe	Trp	Met	Asn	Asn	Val	His	Arg	Val	Met	Pro	
		195					200					205				
Gln	Gly	Phe	Gly	Ala	Thr	Ile	Arg	Ala	Ile	Asn	Gly	Ala	Leu	Glu	Cys	
	210					215					220					
Gly	Gly	Asn	Asn	Pro	Ala	Gln	Met	Asn	Ala	Arg	Val	Gly	Tyr	Tyr	Arg	
225					230					235				240		
Gln	Tyr	Cys	Arg	Gln	Leu	Gly	Val	Asp	Pro	Gly	Pro	Asn	Leu	Thr	Cys	
				245					250					255		